The Oil and Gas Journal

PUBLISHED WEEKLY BY THE PETROLEUM PUBLISHING COMPANY AT TULSA, OKLAHOMA

HOME OFFICE, 211 S. CHEYENNE, TULSA
PHONE 3-6291

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Table of Contents

Vol. 39, No. 30 — December 5, 1940

News Developments

Trends: Efforts Being Made to Correlate Crude and Gasoline Prices 9
Illinois—New Administration Promises Conservation Action 10
Sparks From the News 12
Canadian Refineries Restricted With Respect to Sources of Crude Oil and Markets for Products ..... *W. T. Ziegenhain* 13
Italy May Lose Albanian Oil Due to Greek Counterdrive ..... *J. P. O'Donnell* 15
News From the State Capitals 16
Editorial: Re Wages and Hours 17
Wage-Hour Law Creasing Brows of All Branches of Industry ..... *Clarel B. Mapes* 18
West Central Texas Operators Urge New Regulatory Board 18
Espionage and Sabotage Are Not Deterring Defense Plans ..... *Henry D. Ralph* 21
Ickes Indicates Approval of Federal Control Legislation 22
Committee to Safeguard Storage 22
F.P.C. Cites Four Oil Companies for Price Discrimination 22
Deaths 25
The Markets 25
Service on Active Fields—Chapel Hill Field, Smith County, Texas 26
Natural Gas News 29
Natural Gasoline News 29
Refinery Expansion 29
Programs and Meetings 32
Pipe-Line Activity 58

Engineering—Operating

Socony-Vacuum Finishes New York Gasoline Line ..... *Paul Reed* 34
Constitution Diagrams and Composition of Methane and Ethane Hydrates ..... *O. L. Roberts, E. R. Brownscombe and L. S. Howe* 37
Operating Ideas 42
Recent Advances in Illinois Drilling Practices ..... *Bart De Laat* 45
Safety: Guard on Stem of Horizontal Valve 49
Choice of Charging Stocks to Make High-Octane Fuels ..... *Henry N. LaCroix* 50
Constancy of Application Is Important Factor in Cathodic Protection ..... *Neil Williams* 53
Motor Operation of Valves for Oil Refineries ..... *C. W. Kuhn* 54
Questions on Technology ..... *W. L. Nelson* 56

Field Developments

Field Developments 61
Permian Basin, Panhandle ..... *R. Marne Sanford* 62
North Central Texas *R. Marne Sanford* 65
Kansas 66
Forest City Basin 66
Oklahoma 69
Texas Gulf Coast ..... *Neil Williams* 70
N. Louisiana, Arkansas *George Weber* 73
Louisiana Gulf Coast *F. L. Singleton* 74
Illinois 76
Appalachian Fields 78
Southwest Texas ..... *F. L. Singleton* 79
Among Drilling Contractors 80
Indiana, Ohio, Kentucky 82
California ..... *L. P. Stockman* 83
Eastern Texas ..... *R. Marne Sanford* 86
Rocky Mountain Area ..... *T. R. Ingram* 87
Michigan ..... *Otto C. Pressprich* 88
Canada ..... *Victor Lauriston* 89
Mississippi ..... *George Weber* 90

Markets and Prices

Group 3 Market ..... *H. Stanley Norman* 94
New York Market ..... *J. P. O'Donnell* 95
A.P.I. Refinery Report 95
Tank-Wagon Market 96
Refinery Prices 97
Crude-Oil Prices 98

Additional Features

Record of Oil Securities 91
Personal Paragraphs 92
Equipment Progress 100
Classified Advertising 102-103
Advertisers' Index 104

SUBSCRIPTIONS: United States, 1 year, $6.00; 6 months, $3.00. Elsewhere, 1 year, $7.00; 6 months, $3.50. SINGLE COPIES: 20 cents each. Back copies, when over a year old, 50 cents. CHANGES OF ADDRESS reaching the Tulsa office of the Journal by Saturday take effect with the following issue.

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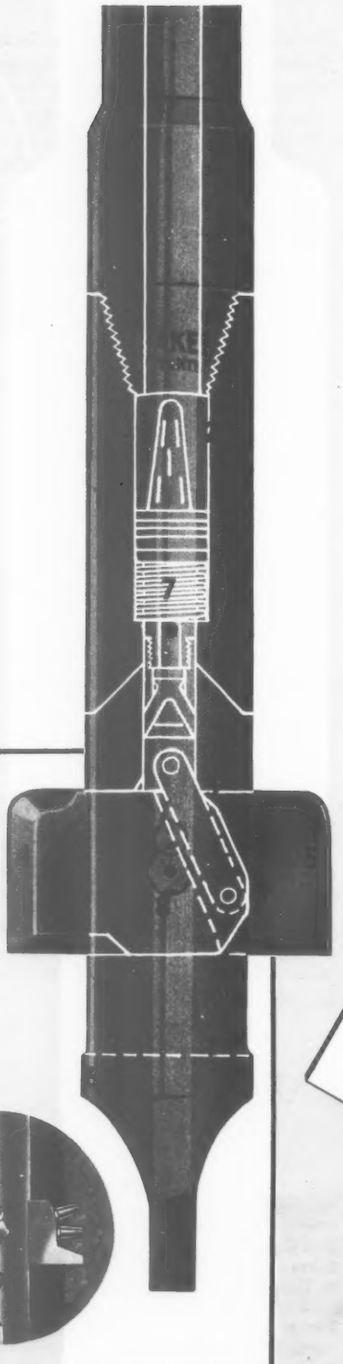

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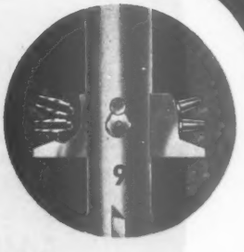

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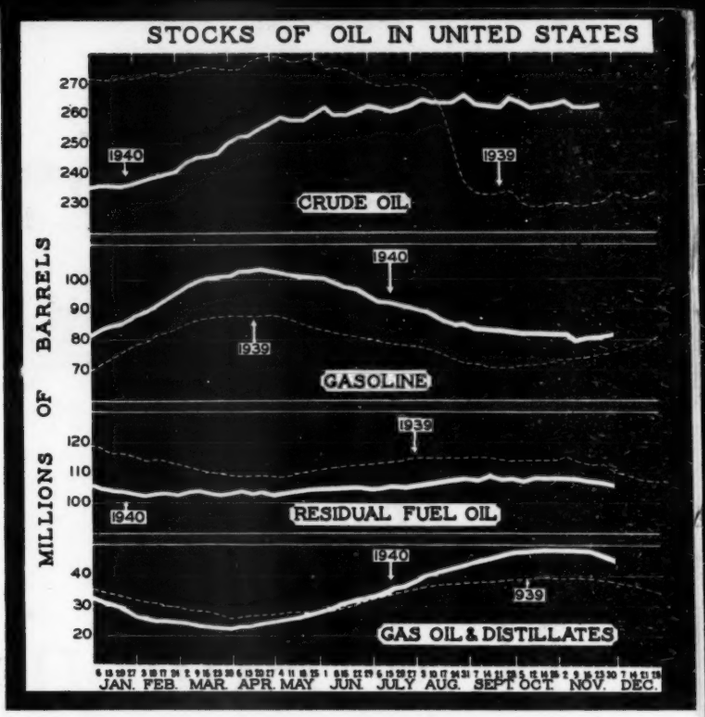
BAKER ROTARY WALL SCRAPER

Trends

Efforts Being Made To Correlate Crude And Gasoline Prices



THE action of a large company in advancing posted dealer prices on gasoline in Texas from one-half to 2 cents per gallon can probably be classed as the most important market development of the week. While the advance was confined to the Lone Star State and it was not known at this writing whether or not it would be supported by other large and small marketers in that state, there is agreement that the advance is a needed step in the right direction which should spread over a large part of the United States.

The executive head of the company making the change in Texas, explained that it was an effort to bring gasoline prices and refinery revenue more in line with the prevailing posted prices for crude oil. The same reasoning could be applied to other parts of the country.

Market students have pointed out that there could be no general improvement in conditions until gasoline prices had advanced from the low levels established through a steady decline which started last year. The average retail price on regular-grade gasoline in 50 cities exclusive of taxes is now around 12.5 cents, 1 cent under the average of a year ago and the lowest level since the depression period of the early thirties. A decline of 1 cent in gasoline prices means a decrease of approximately 25 cents per barrel in the refinery return on a barrel of crude oil.

While a consistent overproduction of gasoline for more than a year has been the principal cause of this decline in the industry's most important product there have been other contributing factors. The general licensing of the use of Ethyl fluid as blending material and its widespread use in the three grades—premium, regular and third grade—of motor fuels has brought confusion in retail merchandising so that the former differences in prices no longer prevail. Widespread trucking of gasoline from refineries and terminals in many areas has also tended to break down price differentials and emphasize undesirable competitive conditions. The net result has been a complete breakdown in posted dealer and retail quotations at many points and these low quotations have been reflected in full in the prices received for gasoline at refineries.

Many now feel that with the recent improvement in the statistical position of gasoline, these wholesale and retail conditions can be advanced. Dealers who for years have shown little concern in maintaining adequate retail prices have suffered from the developments of the past year through decreased margins and presumably will welcome higher postings.

Over the past week there has been continued improvement east of California, in markets for kerosene and fuel oils. In several refining areas further price increases in these products are in prospect through the winter months.

CRUDE PRODUCTION *3,325,725 bbl. daily average—down 443,228 bbl. One year ago 3,297,511 bbl.*

CRUDE STOCKS *261,723,000 bbl. as of November 23 — up 104,000 bbl. One year ago 231,811,000 bbl.*

GASOLINE STOCKS *80,284,000 bbl. as of November 30—up 184,000 bbl. One year ago 76,790,000 bbl.*

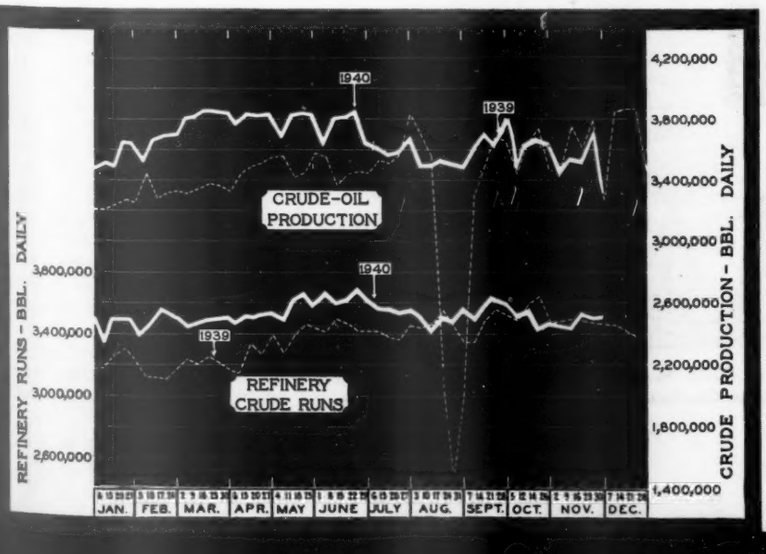
RESIDUAL FUEL-OIL STOCKS *106,618,000 bbl. as of November 30—down 253,000 bbl. One year ago 110,360,000 bbl.*

GAS OIL AND DISTILLATES *46,212,000 bbl. as of November 30—down 1,299,000 bbl. One year ago 37,888,000 bbl.*

REFINERY RUNS *3,510,000 bbl. daily week ended November 30 — same as last week. One year ago 3,480,000 bbl.*

DAILY AVERAGE PRODUCTION FOR WEEK

	Nov. 30, 1940	Bur. Mines Nov. est. of demand	November state allowables	Nov. 23, 1940
Arkansas	64,670	71,000	69,508	69,765
California	595,750	583,000	571,000	605,750
Eastern states	105,200	100,600	.....	105,150
Illinois	330,970	385,000	.....	334,578
Kansas	196,650	186,000	190,000	190,850
Louisiana	282,310	274,000	279,973	284,900
North Louisiana	*63,460*	.....	.....	*66,600*
Louisiana Gulf Coast	*218,850*	.....	.....	*218,300*
Michigan	46,350	51,000	.....	47,150
Mississippi	15,985	13,800	.....	15,625
Nebraska	3,200	.....	.....	3,200
New Mexico	103,410	104,000	104,000	103,420
Oklahoma	403,500	413,000	390,000	400,925
Rocky Mountain states	88,380	97,600	.....	94,790
Texas	1,089,350	1,291,000	1,316,657	1,512,850
East Texas	*298,700*	.....	.....	*447,000*
West Texas	*178,850*	.....	.....	*251,275*
North Central Texas	*134,400*	.....	.....	*151,650*
East Central Texas	*72,850*	.....	.....	*84,200*
Texas Panhandle	*50,450*	.....	.....	*73,825*
Texas Gulf Coast	*278,650*	.....	.....	*398,000*
Southwest Texas	*75,450*	.....	.....	*106,900*
Total United States	3,325,725	3,570,000	.....	3,768,953


REFINERY RUNS - BBL. DAILY
CRUDE PRODUCTION - BBL. DAILY
CRUDE-OIL PRODUCTION
REFINERY CRUDE RUNS
1940
1939
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

ILLINOIS—

New Administration Promises Conservation Action

Refusal of Illinois to enact conservation legislation comparable to that of other oil states and the uncontrolled crude-oil-production expansion in that state starting in 1937, have been developments affecting the entire industry.

In January a Republican governor and legislature take control in Illinois, with important changes in prospect.

In this article, Malden Jones, veteran writer and observer at Illinois' State Capitol, outlines the significance of political changes as they will affect oil.

SPRINGFIELD, Ill., Dec. 2.—"Regulation of the Illinois oil industry through sensible and fair measures enacted by the state legislature this year is a virtual certainty if we are to curb the threat of federal control," Rep. Oral P. Tuttle, Harrisburg, chairman of Illinois Oil Investigation Commission, said today in Chicago.

Mr. Tuttle issued his statement after canceling a previous call for a meeting of the group originally scheduled today in Chicago. He said the gathering, which was slated to formulate a suggested "plan of action" for Gov.-elect Dwight H. Green and the new Republican state administration, was not held because the commission found it had already served its legal usefulness during the last session of the legislature.

Speaking for Republican majority leadership in the legislature, Tuttle said: "We are firmly convinced we must manage affairs in our own house and keep it in order if Illinois oil men are to receive a full measure of freedom to operate successfully without unwarranted federal Government interference."

Mr. Tuttle's opinion was concurred in with striking uniformity by other Republican leaders. They are convinced the new governor will keep his campaign promise to appoint a nonpartisan committee to supplement any action taken by the legislature.

A One-Man Show?

Party leaders are repeatedly expressing the conviction Green will "run a one-man show" and because of this attitude toward administration affairs they foresee eventual selection of Elmer J. Schnackenberg, of Chicago, as his personal choice as the next speaker of the house. Sen. Arnold P. Benson, of Batavia, who has supported Green's recommendation for an "impartial and studious approach to the question of Illinois oil," is generally conceded to be named majority leader in the upper house.

When Illinois changes from Democratic to Republican leadership in January, the state's oil industry will unquestionably occupy a prominent place on a new legislative calendar.

Torn by bitter factional strife which increased steadily during the long illness of the late Gov. Henry Horner, the Democratic party — despite heavy "organization" strength in Chicago and Cook County—lost every major office in the November 5 election contest with the exception of secretary of state.

HUGH W. CROSS
Lieutenant Governor-elect of Illinois

Lt. Gov. John Stelle, of McLeansboro, an ardent opponent of proration legislation, assumed the governorship early on the morning of October 6 to fill out the remainder of Governor Horner's second unexpired term of office.

Dwight H. Green, 43-year-old Chicago lawyer and former U. S. district attorney for northern Illinois, whose record as a counsellor was enhanced by colorful and successful prosecution of Al Capone for income-tax evasion, will be formally inaugurated as governor January 13 in Springfield. (Picture and sketch of Governor-elect Green, November 28 issue, The Oil and Gas Journal, p. 28.)

Six days before Governor-elect Green will be sworn into office, a friendly Republican controlled legislature will convene for its sixty-second biennial session.

Probable Developments

An intelligent forecast of probable legislative developments of interest to the Illinois petroleum industry must be based at the present time on an appraisal of what happened during the last 4 years, coupled with a factual analysis of the complexion of the new government and its leaders.

Petroleum forced itself into the legislative picture after 1937, when new developments in the rapidly expanding Illinois oil basin created a series of demands for and against regulation and taxation. During this period, more than three score measures of particular interest to the oil industry were introduced in both the House and Senate, but vital bills either failed to receive a favorable vote or even to reach passage stage.

When the sixty-first general assembly convened in January 1939, the first batch of suggested "control" bills was thrown into the legislative hopper. These were supplemented by others in a special session which began in April of this year and adjourned in June.

Real "pressure groups," organizations opposing and favoring enactment of conservation or proration measures, began to exert considerable influ-

ence at that time in legislative councils, particularly in committee hearings, during the latter part of the regular session.

Former Governor Horner originally announced himself in favor of a conservation measure in December 1939. He intimated through administration spokesmen that the question would be a required item on the lawmaker's calendar in the special session. He said he favored a 5 per cent tax, and members of his cabinet freely admitted the proposal was open to discussion.

Shortly thereafter the ailing executive was forced to retire from active administration of the state's affairs, and the promised special session date was postponed again and again until April 30, 2 weeks after an eventful primary-election contest, which split the Democratic party into two rival factions.

Lieutenant Governor Stelle, who made political capital of his antiproration stand in oil-basin counties, was overwhelmingly defeated for the gubernatorial nomination by Governor Horner's candidate, Harry B. Hershey, Taylorville attorney and chairman of the party's state central committee.

During the special session Republicans rapidly consolidated their gains, moving toward smooth and harmonious party organization as the date for adjournment approached. Democratic forces, meanwhile, attempted vainly to smother bitterness and personal issues in order to present a united front in the November contest.

Actual party harmony, however, was never attained, although Lieutenant Governor Stelle led a belated attempt to muster uniform voting strength for Mr. Hershey after he took the oath of office on October 6.

Both parties avoided taking positive action on oil legislation during this period because of the exigencies of a critical political campaign, and only one bill of consequence was approved during the special session. It was a measure which required drilling contractors to secure permits from the Department of Mines and Minerals.

Governor Horner was prompted to consider an oil-tax bill as a source of revenue for increased old-age pensions, but Governor-elect Green has trimmed his legislative sails in another direction.

If an oil-tax measure is proposed by the state's new executive, it will be prompted by his new five-point program, the crux of which is an ambitious "economy drive" with slashing of operating expenses as its objective.

This program has already drawn mild critical fire from some of his partisans. It calls for:

1. Conservation of natural resources, a subject which includes legislation designed to regulate the Illinois oil industry as well as imposition of a tax on production.
2. Reduction of taxes and elimination of the 3 per cent sales tax on food, a deficiency which may be made up in part by an oil tax and other special taxes.
3. Revamping of civil-service laws.
4. Parole reform.
5. A general reduction of appropriations in all state departments, leading to possible revision of the state's entire revenue system.

The greater part of this impressive undertaking will succeed, because Republicans control both houses of the general assembly. As a matter of policy, party leaders say they will support the administration program, at least the larger part of it.

The only pledge which veteran legislators doubt can be fulfilled is the new governor's heroic proposal to lop off "waste" in state government expenditures, which, he believes, may run as high as $35,000,000 annually.

In 1938 Republicans controlled the lower house with Representative Hugh W. Cross, of Jerseyville, an able legislator, and now lieutenant governor-elect, as speaker. At that time, there were 79 Republicans and 74 Democrats in that chamber. Today the party still retains control of that body with 78 members against 74 Democrats. In 1938 Democrats dominated the state senate with 31 members against 21 Republicans. Today there are 28 Republicans and 23 Democrats in the upper house, and Lieutenant Governor-elect Cross, who has previously favored a policy of "intelligent and fair control of the oil industry," will serve as its presiding officer.

As this summary and forecast is being written, it is believed Rep. Elmer J. Schnackenberg, of Chicago, who has served 10 terms in the house at various intervals since 1912, and who was minority leader in 1933 and 1937, will be chosen speaker when the first party caucus is called.

Governor-elect Green has already designated Mr. Schnackenberg as his personal choice for the post, a move which has evoked criticism from other party legislators. Chief objections are based on the traditional political rivalry between downstate and Cook County representatives.

Mr. Schnackenberg has never made any public pronouncements on the oil question; hence, his views are generally believed to coincide with those of the new governor, who repeatedly recommended appointment of a nonpartisan commission to settle cardinal petroleum problems during his recent election campaign.

Logical downstate contenders for the speakership are two experienced legislators, both of whom are recognized as the best informed members of the lower house on status of the state's oil industry. They are Oral P. Tuttle, of Harrisburg, and Robert J. Branson, of Centralia.

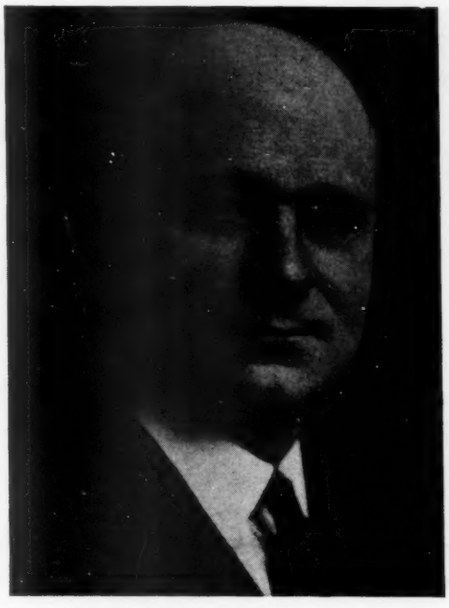
Representative Tuttle, who has also served as a member of the senate, was chairman of an oil-investigation committee created by a house joint resolution, and which conducted hearings at Salem, Centralia, Champaign and Mattoon, "to make a thorough investigation of the subject of oil production, processing, transportation and marketing . . . and to report its recommendations." Representative Branson was a member of the group, comprised of five members each of the house and senate. Recommendations of that committee were presented May 17, 1939, and Republican leaders today regard it as a foundation for oil-legislation policies of the incoming administration.

It is significant that the commission in its final report said, "There is no necessity at this time of enacting laws regulating proration, economic conservation and ratable taking.

"Such laws," the report stated, "would be more harmful than beneficial at this time and would operate without justification to curtail an expanding industry.

"The committee bases its conclusion upon the fact that there is definitely no evidence either of overproduction of oil or disruption of the market and no immediate fear of either of such consequences. Furthermore, it appears that refineries will not come to this state to refine and develop the byproducts of crude oil unless there exists reasonable assurance that they could purchase sufficient crude oil to operate at full capacity."

ORAL P. TUTTLE
Chairman, Illinois Oil Investigation Commission



ROBERT J. BRANSON
Member, Illinois Oil Investigation Commission

ELMER J. SCHNACKENBERG
Next speaker Illinois House of Representatives

SPARKS . . . FROM THE NEWS

MARKET REACTIONS: Tanker rates jumped again last week and it is predicted they will reach $1 per barrel on coastwise movements. The big question is—what will be the reactions on Gulf Coast markets?

HEAVY USERS: Refiners supplying gasoline and diesel fuel to trucks note the new peak established in October when 13.7 per cent more freight was hauled by trucks than in the same period in 1939.

ON GUARD: While it is just as well for the industry to be alert for subversive efforts, there has as yet been no evidence of sabotage within the industry. As the defense program moves along an occasional alarm may be sounded, but these should cause no stampede.

GOING AND COMING: Recently a pipe-line movement of Venezuela crude was started in the Philadelphia area ending in Canada. Now plans are being perfected to move special grades of Mid-Continent crude overland through a series of pipe-line systems to Philadelphia.

DIRECT ACTION: Advances of ½ to 2 cents per gallon in Texas gasoline tank-wagon prices apply ointment where the bruise is sorest.

DECLINE: With the seasonal decline in drilling activity we are only completing two oil wells every hour instead of one every 26 minutes.

GASLESS PLANE: Italy's announcement of a combat plane having no motor or propellor is probably more an indication of that country's need to conserve gasoline than a mark of superior aviation engineering knowledge.

CONSISTENCY: Oil companies are being sued by one government department for conspiring to keep gasoline prices up while another department accuses them of price-cutting.

PLENTY OF COMPANY: A speaker urges operators to use their own best judgment in applying wage and hour regulations. Later developments may prove they were wrong but they are certain to have plenty of company.

FAR AFIELD: Arguments in Texas as to whether the state should have a separate oil and gas commission travel far afield. They encompass the Alamo, states' rights, the price of cotton and the issues of the recent national election.

NO QUESTION: Illinois' governor-elect makes no definite promises as to what he intends to do in regard to oil conservation regulations but he does promise a complete investigation. If he makes the investigation there will be no question as to the action.

SOMETHING NEW IN NOVELTIES: A northern industrial state which is not served by any natural-gas pipe-line system has stopped construction of a major line on the plea that the state had no regulations applying to "novel" operations of this kind.

WHOSE OIL'S WHOSE? Greece is threatening to capture Italy's Albanian oil fields. This brings to mind that Italy dirtied her hands in establishing ownership.

OIL CONSERVATION: Canadian refiners are temporarily closing their eyes to new markets for their products. This is part of the country's program to restrict the use of its oil resources to prosecuting the war.

KEROSENE AGE RETURNS . . .

Emergency functions went ahead uninterrupted with the use of kerosene for light when electrical service "washed out" recently in Amarillo, Tex. The most severe ice storm in the history of the Panhandle isolated Amarillo from supplies of electrical power for days. Here Nurse Vera McNeill is tending her charges under the illuminating rays of a kerosene lamp

Canadian Refineries Restricted With Respect to Sources of Crude Oil and Markets for Products

By W. T. ZIEGENHAIN

Canada has many refineries grouped into three distinct sections but except for a few, these plants are small. They receive much of their crude from the United States by tanker but recently Canadian refiners have directed a more attentive ear to the eastern Venezuela producers who are offering light oil in large quantities and at prices and exchange rates favorable to Canada. This reflects the loss of European markets.

THE 54 oil refineries operating in Canada seem to arrange themselves geographically into three groups, namely, the West Coast, eastern, and interior. Reference to the accompanying map will show why this grouping is suggested. However, the arrangement seems all the more logical when a study is made of the respective sources of crude oil and the markets available to each.

The refineries located in the East and on the West Coast depend almost 100 per cent upon the United States and South America for crude.

The refineries located in the interior and primarily those of Alberta and Saskatchewan are quite numerous, but their combined daily requirements for crude total less than 40,000 bbl., and the local fields supply three-fourths of their needs. Deficits in the local crude production in any area is equalized by deliveries of oil from Montana, Illinois, Oklahoma, Kansas, Colorado, or West Texas, depending upon circumstances at the particular time. Such deliveries in expanded quantities are especially attractive at times when flush fields are under development in any one of them. Montana supplies approximately 3,000 bbl. daily.

During such times the oil is usually available for shipment by rail and at prices substantially below the general field price. The difference in prices will often cover a substantial portion of the rail-haul cost.

Expansion of Capacity

With these three groups of refineries in mind and especially cognizant of the respective sources of crude oil, it is of interest to note any shift in the relative refining capacites of these groups during the past year in order to supply products under wartime conditions.

Strange as it may seem, Canada has not greatly expanded its oil-refining capacity. Instead, the nation has tried to balance its output of crude oil and domestic demands in order to hold the purchase of foreign oil to a minimum. The nation's objectives in this respect may be summarized as follows:

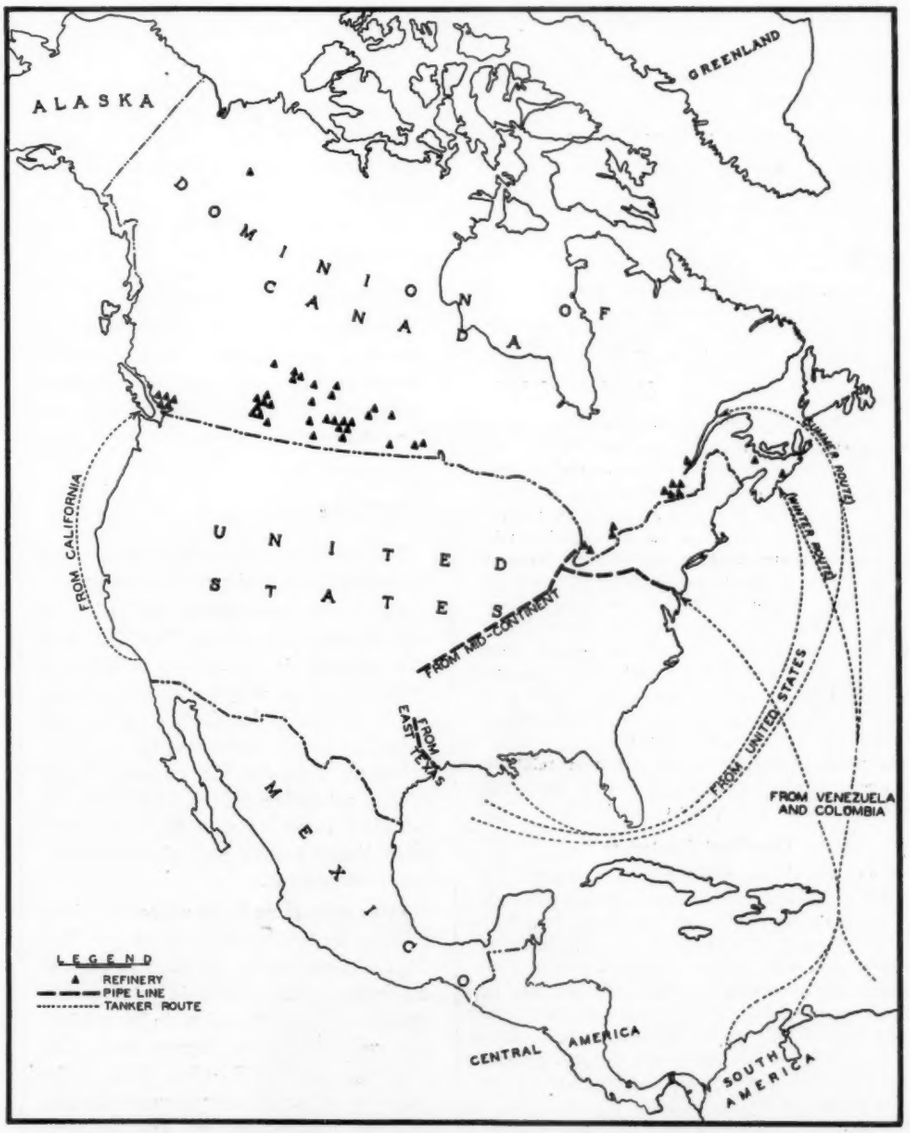
Imports of foreign gasoline will be eliminated as much as possible by a fuller utilization of refining facilities in the country.

Control over the drilling of new wells may be exercised through a system of licensing.

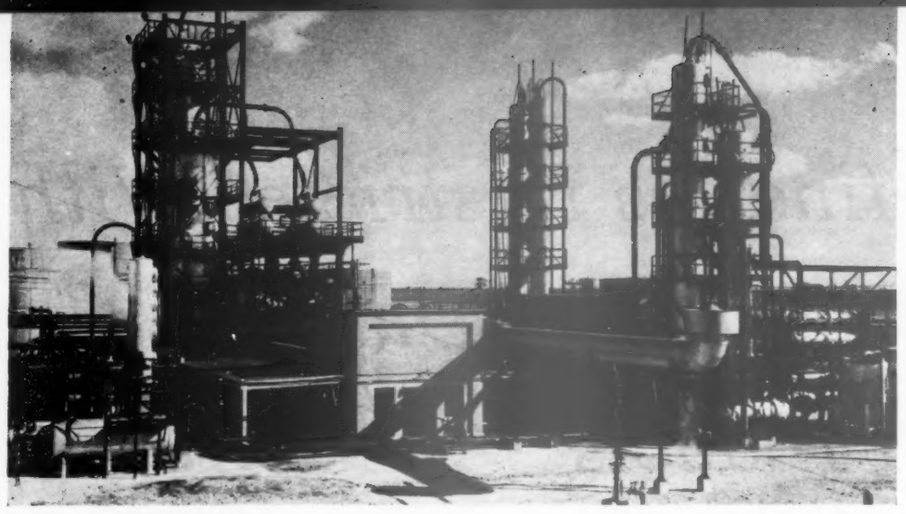
Encouragement for increasing the production of crude oil is planned. Legislation and taxation are now under review to see what can be done in this regard.

This program was more forcefully outlined by George R. Cottrelle, oil controller for Canada, when he recently said: "Not one dollar of our vital and limited supplies of foreign exchange is to be spent on foreign oil that can be saved."

As a part of this broad program the country was recently placed under regulations which forebade the expansion of oil uses. This move has temporarily eliminated the chance of manufac-



Canadian refineries are numerous and generally divide themselves among three groups. Since the country imports most of its crude requirements, the plants along the St. Lawrence River and Pacific Ocean are larger than average. Three-fourths of the nation's refinery capacity is in the eastern provinces.



Debutanizer, crude stabilizer and the absorption unit in the Sarnia, Ontario, refinery of Imperial Oil, Ltd.

turers and home owners to replace coal and other fuels by oil almost without regard to the advantages which oil might present over other fuels.

All of these factors have influenced the nation's refining program and it is significant that in the past year only 13,550 bbl. daily of crude capacity has been added and yet Canada is able to supply all its present needs for lubricants and practically all of its gasoline requirements. Canada needs only to be assured of a source of crude oil of refinable quality. The country is especially well fortified by having secured ample sources of 100-octane gasoline to meet all present and immediate future demands.

Distribution of New Capacity

Analyzing the distribution of this expansion, the totals reveal a growth in daily crude capacity among these three groups in about the same proportion as their 1939 capacities. A tabulation of these follows:

REFINERY CAPACITIES OF GROUPS
(Bbl. crude daily)

Group—	Nov. 1, 1939	Nov. 1, 1940
West Coast	22,200	24,500
Interior	38,300	40,550
Eastern	147,800	156,800
Total	208,300	221,850

From these data, the relative importance of the East Coast group becomes apparent but in this grouping it is necessary to recognize the St. Lawrence River and Great Lakes plants as major parts. The inclusion in this group of all Ontario refineries as far west as Sarnia explains why the eastern group holds a commanding position.

These plants chose to locate in the St. Lawrence Valley and in the Great Lakes regions because of the concentration of population there. These afforded a ready market for their refined products and they knew they could always depend upon supplies of crude coming from either Central Canada, the United States, Mexico, South America, or from several of them.

At present, of course, the status of relations between Canada and Mexico automatically eliminates Mexico as a supplier of crude oil.

Our Best Customer

Even before the present war, however, the United States consistently supplied the great bulk of Canada's outside crude requirements. The United States has generally supplied from 70 to 75 per cent of the total volume imported. This volume has approximated 90,000 bbl. per day in recent years and as a result Canada represents this country's largest customer for crude oil. The other 25 per cent has been made up by shipments from Colombia, Venezuela, and Peru, and in the order of importance as named.

Of the crude received from the outside, Quebec refineries have received nearly half, while Ontario has received about 25 per cent, and the remainder has gone to plants located in British Columbia, Nova Scotia, Alberta, Manitoba, and Saskatchewan, in the order of volume as named.

In addition to this volume of crude approximately 15,000 bbl. of imported refined oils from the United States were received daily. The importance of Canada as a customer of United States oil producers and refineries becomes apparent.

On the other hand, Canada is fortunate in having a neighbor which can supply relatively large quantities of the kind of oil which the country demands. This is especially so in view of Canada's inability to substantially raise its output of crude oil despite consistent efforts. In the first 9 months of 1940, Canada produced 6,268,565 bbl. compared with 5,787,117 bbl. in the same period last year. While this represents an increase of a little more than 8 per cent, the most impressive gains were restricted to the early part of this period and the last half of the period has been in balance.

Sources of Foreign Crude

The great bulk of crude and refined products shipped from the United States into Canada is handled by boat. In the past 10 years most of it has moved from the Gulf Coast terminals, around the tip of Florida and then along the East Coast to unload near Halifax in the winter months or go up the St. Lawrence River during the summer months.

While the East Texas field in the United States was in the flush stages of production, large quantities of this oil went into Canada by tanker and by rail. This was primarily because of the crude's unusual suitability to Canada's particular refining needs and because it was readily available at relatively low prices. Then as the East Texas oil field's production became stabilized and prices there were advanced to a more nearly normal level, considerably less East Texas crude found its way into Canada.

Then, in the more recent years, Illinois crude replaced East Texas oil to some degree. Low prices and unstable field conditions were the principal contributors to this change.

Now that Illinois production is declining, Canada is forced to make bids for more distant oil. Quite recently the light oil produced in eastern Venezuela has been sought. Arrangements have been completed for the daily delivery of at least 10,000 bbl. of this oil to the Imperial Oil Co., Ltd., 33,000-bbl. refinery at Sarnia, Ont. This crude will move from eastern Venezuela by tanker to Marcus Hook, Pa., and from here it will move through the Susquehanna and National Transit pipe-line systems to Colegrove, Pa., where the Northern pipe line will take it for delivery to the Buckeye system at Cygnet, Ohio. From this line the Transit & Storage system will pick it up and will deliver it to the Sarnia refinery.

This is the first time any substantial deliveries of foreign oil have been transported through the pipe lines of the country. This movement facilitates the more constant and prompt delivery of high-gravity South American crude in competition with crude oils produced in the United States. However, one would be shortsighted to discourage this movement since the oil could move to Canada by other means and under the present arrangement at least several pipe-line companies receive an added income from these operations.

The purchase of South American oil also reflects the monetary exchange disadvantages imposed on United States products offered in world trade. Canada frankly states that it must conserve its expenditures because of this and when it is necessary to buy on the outside, Canada naturally buys where it can get the most for its money. Canada is able to buy in South America at an advantage partly because the continent has lost a very large part of its European business and it is more anxious to sell to Canada on the latter's terms.

Coming . .

Complete Oil Map of South America

A feature of The Oil and Gas Journal's Annual International Number, December 26, will be an insert 30 by 40 in., four-color map of South America. The map information will include the location of oil fields, refineries, pipe lines, tanker routes, airlines, and major cities and terminals.

This feature meets the usual high standards of The Oil and Gas Journal in map making. In compiling the map data, the Journal's editors had the cooperation of the governments of South America, departments of the United States Government, and the leading companies operating in the continent to the south.

Veniendo . .

Publicaremos un mapa completo de la industria petrolifera Sudamerica.

Un rasgo interesante del número anual internacional de The Oil and Gas Journal de deciembre 26 sera la insercion de un mapa a cuatro colores de 30 x 40 pulgadas de la América del Sur. Este mapa contendra informacion sobre la unicacion de campos petrolíferos, refinerías, líneas de tubería de petróleo, rutas de transporte por tanques, líneas aereas, ciudades importantes y terminales.

Estes mapas se basa sobre las altas normas de precision seguidas por The Oil and Gas Journal. En la recopilacion de datos los directores de este revista recibieron la cooperación de los gobiernos sudamericanos, departmentos del gobierno de los Estados Unidos de América e importantes compañías petroleras establecidas en las América del Sur.

Italy May Lose Albanian Oil Due to Greek Counterdrive

By J. P. O'DONNELL

NEW YORK, Dec. 3.—The possibility that Italy will relinquish a normally small but currently important source of crude oil as a result of her so far ill-starred attack on Greece looms as a result of the successful Greek counterdrive. This drive has carried Greek armies to within 35 miles of Albania's Devoli fields, one of Italy's few remaining sources of crude oil.

The Devoli fields are located in the triangle formed by the union of the Devoli and Osum rivers at the point where they form the Semeni River, a few miles north of the town of Berat. These fields are about 50 miles north and west of the Greek-Albanian border but are only about 35 miles west of the town of Pogradec, on the western shores of Lake Ochrida, where Greek forces have made their greatest advances.

Continuing successes of the Greek armies have led neutral military observers, familiar with southern Albania's rugged terrain, to the conclusion that the Italians will have to withdraw as far north as the Shukumini River before they can organize effective resistance. If this resort is forced upon the Italians, they will not only lose the Albanian oil fields in doing so but will also give up the 46-mile pipe line which connects the Devoli fields with the port of Valona.

The location of the Albanian fields and the Devoli-Valona pipe line with respect to the points of Greek advances is shown in the accompanying map. Pogradec is almost directly east of the fields of Devoli while Argyrokastron, one of the two principal Italian bases, is 50 miles south. Other fields shown on this map are of minor importance.

While oil production has been obtained elsewhere in Albania, the only production of consequence is in the Devoli area. According to reports published early this year, the Devoli production has been brought up to 4,250 bbl. per day by intensive drilling and the introduction of modern methods of production, including gas drive. This oil is transported by way of the pipe line to Valona and thence by tanker to Bari.

Loss Would Be Vital

Under normal circumstances this volume was almost negligible and constituted only a minor fraction of Italy's imports. By her entry into the war, Italy sacrificed every source of crude but the wholly inadequate supplies available in continental Europe. The inadequacy of these supplies forced the shutting down of a number of Italian refineries, some of which have been shut down for months. These include the Raffinerie di Napoli refinery at Naples which has the only Houdry catalytic cracking unit operating in Europe and which is most distant from existing crude supplies.

With refineries shut down for lack of crude, Italy has found her meager Albanian production of increased importance. The Bari and Leghorn refineries, which normally run Albanian crude, are equipped with hydrogenation units by which they are reported to be able to obtain a yield of 80 per cent of gasoline. The reported 19,000 tons per month crude-oil production is equivalent to 126,768 bbl. An 80 per cent gasoline yield would give Italy more than 100,000 bbl., or upward of 4,250,000 gal., of motor fuel per month from Albanian crude. In addition, her east coast refinery at Bari is said to be able, through a combination of polymerization and hydrogenation, to produce a very good yield of aviation gasoline. The Bari refinery was the first Italian refinery to produce aviation-grade gasoline.

If the Italian armies are forced to withdraw north of the Semeni and Devoli rivers, Italy will doubtless lose Albanian oil for a long time, possibly for the duration of the war, even if they are successful in recapturing the territory lost in withdrawing. It is certain that a retreating Greek Army would do as much damage as possible to the oil fields and would destroy the pipe line. This line, opened in December 1935, passes through Fieri, Rockevec and Skrafotini and has its terminus at Uji-i-Ftohet.

Vulnerable to R.A.F. Raids

British aviators have already taken advantage of the proximity of Greek bases to raid Italian oil refineries and the Bari plant is among those which have been subjected to air raids. The extent of the damage to the plant is, of course, unknown. The port of Valona, where the Devoli pipe line delivers the crude oil to underground storage, has also been bombed but details of the results of this attack are also lacking. While the success of these attacks is open to question, there is no doubt that Italy has further imperiled an already perilous petroleum-supply situation.

If the Greeks are successful in wresting the Devoli area from the Italians it will make the first loss of a continental oil supply by the Axis powers. Previously Germany had acquired the South Vienna basin field in Austria and the north basin fields in Czechoslovakia, as well as the Pechelbronn field of northwestern France. In addition, the Polish fields, centered in the "rump state" created between the former Polish areas annexed by Germany and Russia, are undoubtedly supplying oil to the Reich.

Another result of the Greek successes is to make possible, if necessary, a better joint defense of the Near East oil fields by Great Britain, Turkey and Greece. The Italian failure in Greece is regarded by some as one reason for the abrupt termination of the German diplomatic invasion of the lower Balkans. British planes could have easily bombed Rumania's concentrated refining districts from Greek bases but the maintenance of Bulgaria as a neutral keeps a buffer state between Greece and Rumania, a situation which, especially in view of the internal troubles in Rumania, is eminently suitable to the Axis.

Rumanian Fields Safe

When Rumania formally joined the German-Italian-Japanese alliance, she automatically opened herself to legitimate attack. Even though she was supplying the Axis nations with oil, Rumania's technical neutrality prevented the British air force from attacking her without violating that neutrality. Now a belt of neutral nations protects Rumania from air attack from Greece. It would be impossible for British planes to reach Ploesti without flying over neutral Yugoslavia, Bulgaria or Turkey. Had Bulgaria joined the Axis there is little doubt but what Great Britain would have launched heavy attacks on Rumania's oil districts.

The report that Russian intercession was at least partly responsible for Bulgaria's decision to remain outside the Axis is taken as an indication that the Soviet is not favorably disposed to Germany's drive to the east. Therefore it may be assumed that this normally unpredictable factor will at least hinder any attempt by Germany to extend her acquisitions beyond their present eastern limits and that a German plan to acquire the near eastern fields will have to reckon with Russia.

Map showing location of Albanian oil fields and pipe line

STATE CAPITALS...

KANSAS

AN INCREASE OF ABOUT 4,000 BBL. daily in the market demand for Kansas crude oil for December was indicated Friday as the Kansas Corporation Commission took under advisement the December state allowable. Theo A. Morgan, conservation director of the commission, estimated the state's market demand for the month would reach 190,000 bbl. daily, as compared with nominations of 186,000 bbl. in November. Mr. Morgan, at the monthly market-demand hearing held in Wichita, stated nominations for nearly 183,000 bbl. already had been received. Others not received, he expected, would send the total to about 190,000 bbl. The Bureau of Mines estimates December market demand for Kansas crude oil at 188,400 bbl., an increase of 2,400 over the November daily figure.

TEXAS

THE TEXAS LEGISLATURE when it meets in 1941 may be asked to enact broad changes in the structure of that state's oil and gas proration laws. Present indices point to the possibility of tumultuous legislative tussles over the subject, sharply contrasting with the past two sessions when oil and gas measures were fairly well received. Measures that may be submitted to the legislature, or at least are being considered by one group or another for introduction to the legislature, include:

1. A new oil and gas commission, appointive by governor and its personnel trained in the oil industry, to replace the overburdened Railroad Commission in the administration of proration and regulation of the industry. This change is being supported by five oil and gas associations (West Central Oil and Gas Association, East Texas Oil Association, Panhandle Producers and Royalty Owners Association, North Texas Oil and Gas Association, and the Permian Basin Oil Association) and the Texas Manufacturers Association. While these groups have passed resolutions favoring such a change, a question in the mind of some observers is, will they continue to sponsor such a commission change after the legislature meets and after the pending change is made in the commission's personnel? The president of the West Central group, Joe A. Clarke, Albany, has promised a bill embodying their proposals would be among the first introduced next January.

2. The oil-proration laws should include a proration formula—a statement of principles in the statutes which the regulatory body must consider in fixing allowable production and in prorating the various fields. This possibility was discussed at the recent state-wide oil-prorating hearing held in Austin.

3. The marginal-well law is thought by many operators to be much in need of clarification, and by some, repeal. The marginal-well law, as interpreted by the commission in its application of proration, has been a stumbling block in many proration schemes for individual fields, particularly in East Texas. Faced with continually declining per-well allowables, some operators feel that the marginal limit should be lowered. Or if the present limits are maintained, the law should not be applied to flowing wells. If the marginal limit should be lowered, need for shutdowns would be eliminated. This would eliminate many evils prevalent under the "shutdown" method of proration—the most prominent of which is the many necessary (or otherwise) exemptions.

4. More adequate control of natural-gas production and utilization likewise is expected to be brought before the legislature. Previous attempts to regulate gas production have not been successful; about all that has been accomplished is that statutes prevent use of sweet gas in the manufacture of carbon black. Recycling of gas in the production of condensate is steadily becoming a larger factor in Texas' production, and inequities exist that also need legislative attention. Thus new attempts to cope with gas regulation may be forthcoming in the 1941 legislature.

AN ALLOWABLE OIL PRODUCTION during December and January of only 157 bbl. over the Bureau of Mines estimated market demand, when underproduction of allowables is taken into consideration, was set by the Railroad Commission in its order of last week. Starting with a basic allowable of 1,754,726 bbl. daily, the 9 shutdown days of each month were figured by the commission to reduce the daily allowable production to about 1,316,657 bbl. From this it deducted 39,500 bbl., because experience has proved that operators average about 3 per cent under the amount they are allowed to produce. This brought the net allowable down to 1,277,157 bbl. daily, as compared with the Bureau of Mines figure of 1,277,000 bbl. daily for December.

Shutdown days, the same monthly number as was stipulated in the 90-day order that expired November 30, will be December 1, 7, 8, 14, 15, 21, 22, 25 and 31 and January 1, 4, 5, 11, 12, 18, 19, 25 and 26.

On its face the new order differs but little from that which was issued back in August for the months of September, October and November. However, numerous exemptions from shutdowns marked the previous order, while the current schedule exempts comparatively few fields. Study of the order shows comparatively few changes from the previous order, with the exception of the exemptions eliminated by the commission's special order of November 4.

OIL STATE GEOLOGIST . . .

E. W. KRAMPERT

Wyoming's new state geologist is E. W. Krampert of Casper, who was recently appointed to that position by Gov. Nels H. Smith to succeed Dr. S. H. Knight. Mr. Krampert's abilities as an accredited petroleum geologist are attested to by the wide practice he enjoys through the Rocky Mountain region. He entered that territory with Roxana Petroleum Co. to conduct the original mapping and detail work on the Wellington-Fort Collins field in Colorado. He later accepted a position as chief geologist with Prairie Oil & Gas Co. of Wyoming, but in 1932 resigned from this office to enter private practice, where he remained for 3 years. In 1935 Mr. Krampert joined the staff of Superior Oil Co., but after about a year once again returned to private practice as a consulting geologist. He will continue this work while acting in the capacity as geologist for the State of Wyoming

LOUISIANA

THE DEPARTMENT OF CONSERVATION, Minerals Division, has ordered that a state-wide hearing be held in the Conservation Museum, New Orleans, on December 12 at 10 a.m. for the purpose of adoption of rules and regulations governing the method of reporting the production, transporting, storing, and refining of oil, and reports covering the same.

OKLAHOMA

OKLAHOMA'S OCTOBER PRODUCTION averaged 401,303 bbl. daily to exceed the state allowable by 11,303 bbl., but was under the Bureau of Mines estimate by 2,197 bbl. daily, W. J. Armstrong, chief conservation officer, reported Saturday. Oklahoma City's Wilcox zone, only Class A area, averaged 80,784 bbl. for an excess of 900 bbl. The 31 fields in Class B averaged 96,777 bbl. for a net underage of 2,256 bbl.; St. Louis area was off 2,192 bbl.; Moore was off 554 bbl.; Lucien was off 800 bbl., and other areas slightly less; Shawnee pool has an overage of 409 bbl.; Little River was over 384 bbl.; Frederick-deep was over 351 bbl., and Billings-Wilcox was over 474 bbl.

Five areas in the Class C group averaged 15,007 bbl. for a net underage of 756 bbl. Six pools in Class D had a net overage of 258 bbl. to produce 952 bbl. daily. The 28 areas in the unclassified group averaged 52,700 bbl. to go over 2,225 bbl. daily. Prorated areas overproduced 371 bbl. to yield 246,220 bbl. daily, while the unprorated areas were over 10,932 bbl. for 155,083 bbl. daily.

THE CORPORATION COMMISSION has set for hearing December 11 application of the Danciger Oil & Refineries, Inc., for 40-acre well spacing of the Layton sand zone in the Lovell field of Logan County. Application covers 6,720 acres, listed as the NW and SW of Section 15, all of Sections 16, 21, 22, 27, 28, 33, 34, and NW and SW of Section 26, and NW and SW of 35-18n-4w, and all of Section 3, and NW and SW of Section 2 and NE and SE of 4-17n-2w. Several wells had been completed in this zone.

NEW MEXICO

THE NEW MEXICO OIL CONSERVATION Commission Saturday set the state's allowable oil production for December at 104,000 bbl. daily, the same figure as November. The December allowable is 4,400 bbl. above the Bureau of Mines recommended estimate for the reason, said Commission Sec. Carl Livingston, "that New Mexico oil production has been actually under the bureau's estimate during the entire year."

THE NEW MEXICO SUPREME COURT last week held unanimously that Humble Pipe Line Co. is liable to state income tax on revenue produced in New Mexico. The opinion reversed two lower-court judgments which held the company was a common carrier in interstate commerce as it operates a pipe line from southeastern New Mexico into Texas. The state Bureau of Revenue appealed the case, seeking payment of $3,287 tax plus interest and penalties.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Re Wages and Hours

The increasing difficulties experienced in applying provisions of the Fair Labor Standards Act are furnishing another example of the dangers in federal law making when applied to economic activities.

After 2 years, those who have endeavored to administer the law concede that they have a long way to go before employer and employe will know the full significance of an act which, through general but rigid regulations, seeks to solve problems which are essentially flexible in character.

Designed to advance minimum standards in wages and hours and to widen employment, the enforcement of the act in its present form has tended to contract employment and nullify the accomplishments of those industries that have in the past steadily expanded the earnings and improved the positions of their employes.

The oil-company executive who said his management in recent months had spent more time trying to apply the announced regulations under the act to its employes than it had in directing their work, did not greatly exaggerate the plight of many employers.

Enforcing regulations affecting hours and wages in an automobile or garment factory, where labor conditions are relatively uniform within plants and between plants, is far easier than the application of these same rules to the complicated operations of the oil industry.

The situation in the producing branch of the petroleum industry is particularly difficult.

Here we have more than 2,000 scattered fields and tens of thousands of properties, no two of which are operated under exactly the same conditions.

On adjoining leases in one field will be found the operator of a half-dozen stripper wells and the large owner of a hundred or more wells. A few miles distant may be a newer field with flowing wells and drilling operations still under way.

It is not surprising that under these conditions important differences in employment arrangements are found. The small operator has labor problems not found in a large operation. The labor policies of a major company must take into consideration wide differences in conditions within its own operations.

Certain types of work consist largely in checking machine operations. Work requiring the exhaustive expenditure of physical energy is the exception. In some cases employment is continuous and in others irregular, dependent on developments over which the employer has no control. In many instances housing, utilities and transportation are included in the pay envelope.

Margins of profits in most oil operations are narrow. Employment regulations which fail to take into consideration conditions as they are and must be will bring shutdowns and abandonments. Consolidations to reduce costs will be mandatory if operations are circumscribed with rules designed for other industries.

Concomitant with this problem of maintaining employment is the matter of continuing the high wage and salary scales of the petroleum industry. The latest government report shows that weekly and hourly earnings continue far ahead of the average. Weekly earnings in refinery operations averaged $34.84 and in crude-producing operations, $33.74. These compare with a national average for all manufacturing activities of $25.79.

Unreasonable requirements as to hours and labor classifications mean the end of these highly satisfactory earnings in this industry.

The greatest danger in all federal-control measures applying to labor lies in the tendency toward complete regimentation without regard to industrial or sectional lines. This assures wage scales and other employment conditions based on averages. For employes in this industry this means progress in reverse.

Wage-Hour Law Creasing Brow Of All Branches of Industry

By CLAREL B. MAPES
General Secretary, Mid-Continent Oil and Gas Ass'n.*

THE past 2 years of operation of the Fair Labor Standards Act has been a period of "trial," wherein employers, both in the petroleum industry and without, have attempted to find out just what was required under the law so that they could comply with those requirements exactly. This period of trial has of necessity turned into a period of "trial and error." As a consequence, some employers have found that they were doing more than the law required. Others have found that they were not complying fully, and as a consequence have paid penalties or will do so in the future. It goes without saying that this procedure is also a part of the American system.

The Fair Labor Standards Act of 1938 is lacking in flexibility, and is one of those types of laws which would be classed as both rigid in structure and rigid in nature. It is one of those peculiar and rare types of congressional enactments wherein only fundamental principles, with penalties for their violation, are enacted into law.

There are many problems, some of them extremely serious and some of them merely troublesome, which have arisen and will constantly arise under the law as it is now written. This situation is, in my belief, due largely to the structure of the law itself, its rigidity, and the lack of power of its administrator to fully and effectively interpret the law.

First, let me suggest to you, as an employer, that you should read the text of the act and not leave this matter to your lawyer or other advisers. I would suggest that you personally read the regulations issued by the administrator of the Wage and Hour Division, U. S. Department of Labor. Next, I would suggest that you personally read and study the 13 interpretative bulletins which have been issued by the administrator of the Wage and Hour Division. These interpretations are, as their title and text indicate, merely the opinion of the administrator and his staff, and serve only as the present construction of the law by which the administrator will be guided in the performance of his administrative duties unless and until he is directed otherwise by authoritative rulings of the courts. Needless to say, the administrator has taken the position that Congress intended the widest possible application of its regulatory power over interstate commerce, and therefore, in interpreting the statute for the purpose of performing his administrative duties, he has leaned toward a broad interpretation of all provisions of the law. Considering the type of law being administered, these positions are only natural.

Advocates Personal Interpretation

At this point I wish to emphasize that this is one of the principal reasons why I have suggested that you, as employers, should personally read and study the law itself, the official regulations issued by the administrator, and the interpretations which he has promulgated. As a matter of fact, any person's interpretation of the act (except in the case of authorized regulations), whether it be that of the administrator or your own, must eventually be passed on by the courts before it can be finally determined whether or not the interpretation is correct and valid.

In endeavoring to comply with the provisions of the Fair Labor Standards Act of 1938, the main problems which have concerned the petroleum industry have been (1) whether or not the various phases of the petroleum industry, and its related services, are engaged "in (interstate) commerce" or in the production of "goods for (interstate) commerce" and are therefore covered by the provisions of the act; (2) what employes are exempt and what employes are not exempt from the provisions of the law; and (3) what, under the law, constitutes work performed. There have, of course, been other miscellaneous problems, however, in the main, these three general classifications cover the principal problems presented to the petroleum industry.

As to the first problem, the administrator has apparently adopted the general policy that employes are deemed to be engaged in the production of goods "for (interstate) commerce," where the employer intends, hopes, or has reason to believe that the goods, or an unsegregated part of the goods, will move in interstate commerce.

Further, the administrator has adopted a very broad interpretation of the term "production," and has taken the position that employes doing work necessary to obtain oil from the earth (drilling oil wells, rig building, acidizing, shooting, etc.) are within the purview of the act.

The second principal problem which has faced the petroleum industry in its endeavor to comply with the act is largely contained within Section 13 (*a*).

Employes Classified

Under date of October 19, 1938, the administrator issued regulations—Part 541—delimiting and defining executive employes, administrative employes, professional employes, and employes in a local retailing capacity and in the capacity of outside salesmen. The regulations, as issued, produced widespread confusion concerning the application to the personnel of the petroleum industry.

By way of example, in the petroleum industry there was much question concerning the status of auditors, traveling inventory men, district ma-

(Continued on Page 25)

*Taken from an address before the West Central Texas Oil and Gas Association meeting at Abilene, Tex., December 2.

West Central Texas Operators Urge New Regulatory Board

ABILENE, Tex., Dec. 2.—Forty members of the Texas Legislature, guests at the ninth annual convention of the West Central Texas Oil and Gas Association here Monday, heard a heated discussion of proposals by independent operators for a new state oil-regulatory board.

They were given a promise they would hear of the issue again at the next legislative session.

The question was brought before an open forum meeting by D. H. Bolin, Wichita Falls, president of the North Texas Oil and Gas Association. Mr. Bolin, echoing resolutions which have recently been passed by his organization, the West Central Group, West Texas, Panhandle, and East Texas independents, declared in favor of a board appointed by the governor which would supplant the duties now carried by the Oil and Gas Division of the Texas Railroad Commission.

He based his arguments on five points. He said the present commissioners themselves had advocated an appointive board; that a new board would keep oil regulation out of politics; keep the commissioners on a full-time job; curtail special privileges, and help eliminate practices which he said may eventually lead to federal control.

Mark McGee, Fort Worth attorney who said "Nobody's paying me a dime and I'm not defending the present commission," answered with an unscheduled appearance. "If you admit everything Mr. Bolin has said is true, you still haven't corrected the error. I'm against lodging the appointive power in the hands of the governor or any other person. There are interests outside the state trying to get the Railroad Commission in their power, and to take that office away from the people," he charged.

"McGee is handing out that old stuff about 'outside interests' again," said former state Senator Clint Small of Austin, in rejoinder. "Texas can take care of her own interests," he said.

In an evening address, Dr. J. C. Karcher of Dallas told assembled oil men and their wives the oil industry was the best fortified and prepared to meet any national-defense needs.

Dr. Karcher forecast neither an increase in crude price nor any strain on the industry in meeting an increased demand which he said may be occasioned by the national emergency. He said he could see no need for special regulations, state or federal, on the oil industry, either now or in the event of war.

W. J. Rhodes, of Breckenridge, was named new president of the association, succeeding Joe A. Clarke, of Albany, who was named a vice president along with C. W. Hoffmann, of Eastland; J. E. Whiteside, of Brownwood, and F. A. Dunigan, of Breckenridge. Malcolm Meek, of Abilene, was named treasurer and J. C. Watson, Abilene, was reelected executive secretary.

About 750 attended the 1-day meeting.

Espionage and Sabotage Are Not Deterring Defense Plans

By HENRY D. RALPH

WASHINGTON, D. C., Dec. 3.—Political and business discussions these days are full of talk about sabotage, espionage, fifth columnists, spies and wreckers, and the subject will be heard more often as the defense program progresses.

Actually there is no wave of sabotage in this country, in spite of a current impression to the contrary, but government officials are urging the managers of petroleum refineries, pipe lines, factories, utilities and other industrial facilities to take adequate steps to guard against possible sabotage and theft of military and industrial secrets.

During the past week there was much discussion in Congress about industrial sabotage, and several bills were introduced dealing with the subject. Much of this discussion, however, really was aimed at strikes and labor disputes in factories working on defense orders, and the two subjects are not properly related except in so far as there may be any truth in rumors that a few unions are dominated by avowed Communists intent on revolution. The subject of strikes in defense industries is and will continue to be a political issue, and the administration will resist any restrictive legislation and will attempt to meet the problem through negotiation and by putting pressure on the unions not to be unreasonable.

Outright sabotage and espionage conducted by paid agents of foreign powers is an entirely different matter from the ordinary labor dispute, and while the problem is not acute at the moment, government agents are attempting to educate plant managers as to the potential problem and methods of combating it. This work is being handled by the Federal Bureau of Investigation, working in cooperation with the intelligence services of the Army and Navy, under special direction from President Roosevelt. The F.B.I. has formed a division of industrial security for this purpose and has trained a special group of agents to cooperate with plant managers in working out systems of protection. At the request of the Army and Navy, the F.B.I. has made studies of more than 1,200 plants having defense contracts, and its agents are available to give similar assistance to other plants on request.

F.B.I. Aid Available

These surveys cover the entire physical property of the companies and include a study of the plant police force, the communication system, care of confidential materials, handling of mail, issuance of identification badges to employes, a study of power lines and the source of power, sources of essential materials, establishment of restricted areas, and all other items and factors pertinent to the proper protection of the plant.

Plant managers desiring assistance in guarding against spies and sabotage are urged to communicate with the F.B.I. either directly or through one of its 50 field offices throughout the country. A confidential book of suggestions for the protection of industrial facilities has been prepared for this purpose, and business men may obtain the loan of a registered copy on a proper showing of need. Where further information is desired the F.B.I. will send an agent to assist in putting the program into effect.

The current impression that there is a wave of sabotage in this country comes from newspaper accounts of fires, explosions and accidents in shipyards and plants making military equipment. The fact is that such mishaps are almost the normal expectation in industrial activity and have come to public attention only because of the great interest in the defense program. Statistics show that during the last 2 years there has been an average of 2,000 fires in factories every month, and during 1939 more than 10,000 factory fires were caused by explosions. The F.B.I. has investigated many recent fires and explosions without finding evidence of sabotage and the conclusion is that most of these were simply industrial accidents of a type to be expected in hazardous occupations or which might have been prevented by strict observance of safety rules. Some isolated cases of mechanical sabotage have been uncovered, but most of these were due to grudges of disgruntled employes or former employes.

In their investigations of plants handling defense orders the F.B.I. agents have uncovered many instances where spies and saboteurs could have easy access to vital parts of the plant or to confidential information. They explain that American business men are not accustomed to anticipated espionage and hence the guard and identification systems at many plants are not adequate to cope with even moderately clever foreign agents. The presence of spies in this country is not a detective-story myth, for the F.B.I. has files on literally thousands of foreign agents, some of whom have been under constant surveillance for years. The bureau feels that counter-espionage is preferable to prosecuting known spies, since by watching them it obtains information on their methods and contacts. This fact is now the subject of controversy between the F.B.I. and the Dies committee of the House which is investigating un-American activities, since the Dies committee favors exposing and prosecuting all foreign agents.

Industrial Secrets Sought

The important thing stressed by F.B.I. agents in conferences with business men is that the majority of the spies in this country are not seeking military secrets but are after industrial, commercial, and financial information which they can sell abroad, particularly new products, new materials, new machines, and new methods of factory production. This sort of spying goes on in time of peace as well as during periods of war, and both workers and executives frequently unwittingly give valuable information on industrial operations to persons who sell the information to foreign agents. Much of the information thus obtained proves to be of little value, but the F.B.I. is attempting to educate American business men to be on constant guard against industrial espionage, whether or not they are actually working on secret military equipment. Some amusing stories could be told by the F.B.I. agents of plant managers who boasted of their fences, guard forces, employe-identification systems, and other protective measures but which the G-men discovered were entirely inadequate to prevent unauthorized access to the drafting room and other vital spots.

Each plant or utility presents its own problem of protection against sabotage and espionage, but the F.B.I. has drawn up a formula which managers may use to check against their own facilities. It tells some of the principal types of information wanted by foreign agents and methods commonly used in obtaining it, and lists typical vulnerable points in plants which might be damaged by saboteurs and hence should be especially protected and guarded. Particular attention is given to the organization of a guard force, selection and identification of employes, checking on visitors, and guarding blueprints, formulas, working models, dies, essential tools and machines, and similar vital parts of a plant. Plant managers are also being urged to take more than ordinary precautions against fires and industrial accidents which, whether or not the result of sabotage, might slow down the ability of industry to fulfill the defense program.

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Refined Products Get Lower Rail Rates

WASHINGTON, D. C., Dec. 2.—Lower rail-freight rates on tank-car lots of refined petroleum products have been permitted by the Interstate Commerce Commission to go into effect from pipe-line and barge terminals in Illinois, Iowa, Minnesota, Nebraska, and Wisconsin to destinations in central western states known as western trunk-line territory.

The reductions were proposed by the railroads to meet actual and potential motor-truck competition, and are substantial for short distances but grade into present rates beyond 300 miles. The reductions were suspended by the I.C.C. since last June on protests from independent refineries in the Mid-Continent field which complained that the new rates would make it more difficult for them to serve northern markets with all-rail shipments. The I.C.C. found that the new rates are compensatory and are not out of line with rates for similar distances in Kansas and Oklahoma, and also found that the movement in question is rapidly being taken from the railroads by private trucking operations. It also held that the I.C.C. has no authority to adjust marketing competition and that failure to put the new rates into effect would not benefit shippers by all-rail routes from the Mid-Continent since gasoline would continue to move by pipe line, barge, and truck.

Ickes Indicates Approval of Federal Control Legislation

WASHINGTON, D. C., Dec. 2.—Secretary of the Interior Ickes reiterated his approval of legislation for federal control of the petroleum industry and government ownership of submerged coastal oil lands at his press conference last week.

Referring to the Cole oil bill still before a House subcommittee, the secretary indicated he is "more strongly than ever" in favor of such legislation. He asserted that oil-conservation laws are greatly needed now due to the drain on oil resources bound to result from the national-defense crisis. No mention was made of the oil-control plans rumored after his recent secret meetings with prominent oil men.

Mr. Ickes stated that temporarily the decrease in petroleum exports and an increase in imports might cause a rise in the total supply, but sooner or later the oil supply will decline because of the war situation. He dwelt on the tremendous amount of petroleum being destroyed abroad by the belligerent nations.

Legislation directing the Justice Department to bring suit to test the Government's title to submerged oil lands on the West Coast was backed by the secretary. He explained that the Interior and Navy departments are both convinced that the lands belong to the Government, but that they had not yet decided on a definite policy of action. He was not sure whether he would ask personally for passage of the legislation now before Congress.

Mr. Ickes cited the building up of our air fleet as reason for the heavy drain on aviation gasoline, and the consequent increase in its demand. He pointed out that the United States still sells large quantities of high-octane gas abroad, especially to Great Britain, but he could not say whether reserve stocks of the gas were adequate for our purposes. "That's too technical," was his reply to questions whether increase of our aviation-gasoline supplies constituted a problem for this country.

After he made known his intention to ask Congress for extension of the Bituminous Coal Act expiring next April 26, the secretary was asked whether he might not instead sponsor a bill to fix prices in the coal, petroleum and natural-gas industries. His answer to that one was "Ouch." He hadn't heard anything about it, he added, implying that the thought had never entered his mind.

Explaining what he meant by oil conservation, Secretary Ickes said that its primary purpose was to prevent all waste, of which in his opinion there is still a great deal. He criticized the rivalry of some oil companies as the cause of "terrible" economic waste, and referred specifically to conditions among the filling stations. The petroleum industry will privately admit that such a situation exists, he said.

Reverting to his usual role of business antagonist, the secretary ironically remarked, "But, of course, private industry is never wasteful. It is always efficient."

Asked whether his resignation had been accepted by the president, Mr. Ickes referred his questioners to the White House, but the next day Mr. Roosevelt refused to clear up the situation.

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Committee to Safeguard Storage

NEW YORK.—Adequate protection of American oil-storage facilities against sabotage and possible aerial bombing, and other measures designed to safeguard oil-storage points throughout the nation, are subjects of defense preparation to be studied by five regional committees of the American Petroleum Institute. Complete personnel of the committees and a more detailed explanation of the scope of their activities have been announced by Executive Vice Pres. W. R. Boyd, Jr.

Scope of the activities of the regional committees, as suggested by the Defense Commission, Mr. Boyd said, will include study of the general problem of safeguarding storage plants against sabotage and aerial bombing, consideration of advantages and disadvantages of underground storage both from the national-defense and economic standpoints, cooperation with local governmental and other agencies, the gathering and compiling of pertinent data about the character, location, and extent of present storage facilities in each region, and the potential need for antiaircraft protection of important points. The national committee will handle questions of policy, and receive reports of the regional committees.

Each regional committee as set up has a majority of members qualified to consider and recommend on all technical and economic questions relating to construction and reconstruction of tankage and connecting lines.

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F.T.C. Cites Four Oil Companies For Price Discrimination

WASHINGTON, D. C., Dec. 3.—Four of the country's largest oil companies must answer December 23 to Federal Trade Commission complaints of price discriminations in violation of the Robinson-Patman Act in the sale of gasoline in the Detroit, Mich., area. Complaints were filed here December 2 against Standard Oil Co. (Indiana), Chicago; Gulf Refining Co., Pittsburgh, Pa.; Texas Co., New York, and Shell Oil Co., Inc., St. Louis, Mo. Respondents were accused of granting discounts of 1 to 2 cents per gallon to certain outlets below the prices charged other retailers.

Standard of Indiana, the complaint alleges, supplying gasoline to approximately 450 retailers in the Detroit area, has sold gasoline to four dealers, Citrin-Kolb Oil Co., Stikeman Oil Co., Inc., Wayne Oil Co., and Ned's Auto Supply Co. at prices ranging from 0.5 to 1.75 cents a gallon lower than the prices charged to other Detroit retailers for gasoline of the same grade.

Gulf allegedly sold gasoline to stations owned by the Firestone Tire & Rubber Co. and the B. F. Goodrich Co. at prices ranging from 1 to 2 cents per gallon lower than the cost to approximately 225 other dealers.

Texas Co., supplying gasoline to more than 80 retailers in the Detroit area, according to the complaint, has sold to the Firestone, Goodrich, and certain other customers at prices ranging from 0.5 to 2 cents a gallon below the price to other retailers.

Shell, the complaint claims, has sold gasoline to Henry Starkey Hickey, trading as "Grand River Oil & Gas Co.," at prices substantially lower than those charged by the respondent to its other Detroit retailer purchasers. The complaint alleges that Mr. Hickey, trading under the name of "Stark Hickey, Inc.," was able to purchase gasoline from Shell at 1 to 1.75 cents a gallon lower than the prices charged other Detroit retailers.

Standard of Indiana Questions Complaint of Trade Commission

CHICAGO, Dec. 3.—Standard Oil Co. (Indiana) today asserted, through Buell F. Jones, general counsel, that it is difficult to understand how facts in the situation would support the Federal Trade Commission's complaint. Standard of Indiana sells, Mr. Jones said, in tank-car quantities to the four customers involved in the F.P.C. complaint. The customers have their own bulk storage and deliver to retail stations with their own trucks. In this manner they assume part of the distributing expense which the company normally has when selling and delivering to retailers. Sales are, moreover, on a competitive basis. If the four Detroit firms were not buying from Standard they could purchase in the open market at equally low prices. Altogether, Mr. Jones said, the situation does not seem to be of the type which the Robinson-Patman Act seeks to prevent, but a normal manufacturer-jobber relationship.

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Gillette Resolution Proposes Investigation of Navy Fuel-Oil Purchases

WASHINGTON, D. C., Dec. 2.—An investigation of Navy purchases of fuel oil is proposed in a resolution introduced in the Senate by Sen. Guy M. Gillette of Iowa. The resolution refers to "current reports" that the Navy has recently rejected low bids on the ground that the oil offered came from Mexico. No action has been taken by the Senate on this resolution. The unofficial explanation for the fact that the Navy has rejected bids to supply Mexican oil is that the "Buy American" act passed several years ago requires the purchase of domestic materials by the Government unless the foreign article is offered at 25 per cent or more below the price of the domestic article.

Boyd Declares Oil Industry Is Prepared for All Demands

NEW YORK.—"The petroleum industry will be functioning at wartime efficiency long before the nation's new defense program is completely organized," William R. Boyd, Jr., executive vice president of the American Petroleum Institute, New York, declared in a broadcast symposium on "Industry and National Defense," last week from New York.

"By expanding its facilities to keep ahead of peacetime demand, the American petroleum industry automatically has prepared to serve the nation in war. The industry's much-criticized 'genius for overbuilding' now may prove to be one of our greatest defense assets, for we possess not only the world's largest petroleum reserves, but an industry with a demonstrated ability to produce, refine, transport, store, distribute, and service more fuels, lubricants, and other essentials of modern warfare than all other nations combined. This industry already is prepared to meet not only military demands, but civilian requirements to the end that no blackout of motor transportation need ever happen here," he further stated.

"The petroleum industry will be functioning at wartime efficiency long before the nation's new defense program is completely organized. Freedom to operate the petroleum industry under the traditional competitive system of enterprise constitutes in itself an assurance of an adequate supply of petroleum and its products," Mr. Boyd concluded.

Will Discuss Leasing Regulations

Michigan Oil and Gas Association's proposal to relax oil and gas well leasing regulations will be discussed by the state Conservation Commission on December 13. The association wants routine 5-year leases extended if drilling is successful, or abandoned if tests fail. Present regulations close a lease at the end of 5 years unless the well thereon is producing.

Wage-Hour Law Creasing Brow Of All Branches of Industry

(Continued from Page 18)

terial men, executive assistants, land men, land and geological scouts, executive secretaries, department and section heads, field and plant supervisors, operating specialists, field petroleum engineers, claim agents, special officers, traffic men, geophysical specialists, tax specialists, safety engineers, insurance specialists, and many others in similar categories.

Analyzing the new regulations briefly, the term "executive" applies to a person "who is a boss over men" and who manages an establishment or a division thereof, directing the work of other employes. Also, he must regularly exercise discretionary powers and must receive a salary of not less than $30 per week.

An "administrative" employe is one "who establishes or effects or carries out policies, but who has little or no authority over the specific actions of individuals." In addition, he must receive a salary of not less than $200 per month, and must regularly assist or advise an administrative or executive employe (such assistance to be of a nonmanual character) and must involve "the exercise of discretion and independent judgment."

Under the present definition, it appears that many junior engineers, junior geologists, and other junior professionals are not exempt from the hours provisions of the act because of the $200 salary requirement, and possibly also because of the fact that the other five requirements of the regulation are enumerated in the conjunctive rather than the disjunctive. It so happens that this particular situation is unusually troublesome in the petroleum industry, which has, for many years, employed professional men of all categories and classifications, many times taking these men immediately upon their graduation from a university and placing them in junior positions, and then giving them the opportunity to learn the industry and advance in responsibility and salary as fast as their qualifications warrant.

What Constitutes Work Performed?

The third general problem which has confronted the petroleum industry in its endeavor to comply with the act is the question as to what constitutes work performed. This question arises more particularly in the case of field employes, and specifically in the case of "resident pumpers."

Employes in this category usually live and work on an isolated lease or group of leases, where generally their duties are to pump a class of oil wells known as "stripper" or marginal wells. Stripper wells are ordinarily defined as capable of producing less than 5 bbl. of oil per day, and a majority produce less than 1 bbl. per day.

The general question arises as to how to calculate the hours worked by resident pumpers, or other resident lease employes, who do not have any definite hours of work. This single question has possibly presented more trouble in the petroleum industry than any other, and there is very little to guide the employer in making his decisions with regard to the problem.

The general counsel of the Wage and Hour Division did, however, under date of December 21, 1938, tentatively express an opinion on this point. The most pertinent paragraph reads as follows:

"It is our opinion that an employe who makes his home at his employer's place of business is not necessarily working 24 hours a day because of that fact. If he is free to come and go as he likes, I do not believe that the fact that he is subject to call 24 hours a day, in the event of the stopping of the pump, would mean that he was on duty 24 hours a day within the meaning of the definition of hours worked in the regulations, Part 516.4. Of course, any time actually worked and any time when he was required to be on the premises would constitute hours worked."

The petroleum industry is not confused about the purpose and effect of the Fair Labor Standards Act, largely because for years it has by itself, of its own volition, done the very things which are fundamentally the essence of the present wage-hour law. Long ago, the industry commenced working toward the elimination and correction of the few labor conditions existing in the industry which might be considered detrimental to the maintenance of a standard of living necessary for the health, efficiency, and general well-being of its employes. I do not know of any place in the petroleum industry where wages lower than the minimum wage provisions of the Fair Labor Standards Act (i.e., the 30-cent-an-hour minimum wage) are paid. As a matter of fact, the average minimum wage is between 65 and 70 cents per hour in the petroleum industry as a whole. According to the U. S. Bureau of Labor Statistics, the average hourly earnings during 1939 in the production phase of the petroleum industry were 87.4 cents per hour; while in the refining phase, the average hourly earnings were 97.4 cents per hour. These average wages compared with an average of 64.3 cents per hour in "all manufacturing industries"; and were higher than was the case in almost all of the "nonmanufacturing industries."

DEATHS

RAY M. COLLINS, 60, pioneer Oklahoma oil operator, died at his home in Tulsa early Sunday, December 1, following a lengthy illness. He had been a resident of Tulsa since 1903 and was a native of Indian Creek, Pa., the son of Charles P. Collins who participated in the industry's earliest activities. Mr. Collins attended Leland Stanford University at Palo Alto, Calif., following which he was a member of university expedition to South America in 1901. He remained in Peru, engaging in the mining business, and in 1903 he came to the Indian Territory. He first formed the Bull Dog Oil Co., then in 1912 was one of the organizers of the Cortez Oil Co. In 1915 Mr. Collins organized and headed the Echo Oil Co., operating in eastern Oklahoma. In 1927 he was appointed umpire in the Greater Seminole field, and aided in the formation of the field's proration system. In recent years Mr. Collins has been semiretired. Surviving him are the widow and two sons, Richard Collins of Goldsmith, Tex., and David Collins, a student at Purdue University.

AUSTIN ALLEN, JR., 33, chief production engineer for Phillips Petroleum Co., Bartlesville, Okla., died from cerebral thrombosis in a Tulsa hospital, November 30. Mr. Allen had been employed by Phillips for 10 years, having been production engineer for the company in the Panhandle until a few months ago when he was promoted to chief production engineer. Previous to being transferred to Amarillo, he had been stationed in the Bartlesville offices. He was a graduate of the University of Missouri. Surviving is the widow, Mrs. Ann Allen.

A. B. GROESBECK, vice president and general manager of United Gas Corp., Houston, Tex., died November 30 at Locust Valley, Long Island, N. Y., after a brief illness. A resident of Houston for about 5 years, he left that city nearly 2 months ago on a trip East, where he was taken ill. A native of Michigan, Mr. Groesbeck joined United about 5 years ago and in 1937 was elected to the position held at the time of his death.

E. H. DeVORE, 79, nationally known geologist and mining engineer, died in a hospital in Fort Worth, Tex., early Tuesday, November 26. His work had taken him into almost every oil field and mining region in the United States and in Mexico during the past 50 years. His death was suffered as a result of injuries received in an automobile accident last February from which he never fully recovered. Dr. DeVore was born in Pittsburg, Pa., and received degrees in petroleum geology, petroleum engineering and mining engineering from the University of Pennsylvania. Some of Dr. DeVore's work included returning the first geological reports on such famous fields as Breckenridge in West Central Texas, the Cripple Creek field, and staking the first location in the famous Humble field on the Texas Gulf Coast where Humble Oil & Refining Co. was started. He was for several years chief engineer and geologist for the Nippissing Mining Co. His funeral in Fort Worth was attended by many of his old-time business associates, some of whom are now heads of major oil or mining companies throughout the United States.

ELMER G. DAY, 40, stillman at the West Tulsa, Okla., refinery of Mid-Continent Petroleum Corp., died in a Tulsa hospital early November 30 from burns received the previous afternoon when a tube of a high-pressure still blew out. He had been employed by the company for about 20 years.

SAMUEL CAMERON, 78, for many years foreman and later owner of the Fairbank oil properties in the Marthaville section of the Petrolia field, Canada, died recently at Copleston, Ont.

WILLIAM McCUTCHEON, 82, one of the first Canadian drillers to work in Austria more than 50 years ago, died recently at Petrolia, Ont.

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THE MARKETS*

CRUDE OIL: Markets for crude oil were steady this week. Strength characterizes crude conditions in the Middle West and eastern sections of the country. Indications that Mid-Continent crude is looked upon to replace sliding production in Illinois gained additional confirmation last week with decision by Kaw Pipe Line Co. to extend its main line in Kansas 23 miles to connect the Bemis pool in Ellis County. There are two major companies in the Pennsylvania district which have not met the November 12 advance of 15 cents.

REFINERY: Demand for distillate fuel oil is growing with each passing week of the winter season. Base markets were unchanged this week but refiners anticipate that another advance will be justified in the near future. Refinery-gasoline demand is following routine lines. Coastwise shipments from the Gulf to North Atlantic terminals regained part of the vigor absent in the last half of November but conditions are still unsatisfactory.

TANK-WAGON AND POSTED DEALER: The Texas Co. launched a Texas-wide advance in the tank-wagon market for gasoline December 3. Increases in Texas cities range from 0.5 to 2 cents per gallon. Distillate fuel-oil prices were advanced throughout the eastern section by 0.25 to 0.5 cent per gallon and a general fuel-oil increase of 0.25 cent was posted December 2 by Standard Oil Co. (Indiana). Kerosene tank-wagon prices moved up 0.2 to 0.7 cent a gallon throughout the Socony-Vacuum Oil Co., Inc., marketing territory. Socony-Vacuum also increased gasoline prices 0.3 cent.

FINANCIAL: Losses by oil securities were extended last week. The market sagged more than a point and regained only a part of the loss at the close. Average of 30 representative stocks for the week ended November 30: High, 23.89; low, 22.68; close, 23.17. Week ended November 23: High, 24.12; low, 23.3; close, 23.50.

*Detailed information in Market Section.

Service on Active Fields

Chapel Hill Field, Smith County, Texas

Compiled by The Oil and Gas Journal

Approved name
Chapel Hill.

Geographic location
Approximately 10 miles west of the central portion of the East Texas field and in central Smith County, eastern Texas.

Principal cities and towns near field
Gladewater, 20 miles north and slightly east. Kilgore, 17 miles northeast. Longview, 27 miles northeast. Tyler, 10 miles northwest. Henderson, 25 miles east and slightly south. Dallas, 115 miles west and slightly north. Shreveport, 80 miles east and slightly north.

Location of supply houses
Ample oil-field supplies are obtainable in Longview, Gladewater, Kilgore, or Tyler, or almost any of the towns near the field. They have all served as supply centers for the East Texas field.

Railroads serving the area
The main railroad nearest the field is the St. Louis & Southwestern which comes out of Central Texas and runs into northeastern Texas through Athens, Tyler, Gilmer, and Pittsburg. The line is about 8 miles west of the field. Many railroad companies have lines into Longview, Kilgore, and other towns in the area.

Trucking and hauling facilities
Adequate trucking and hauling facilities are available in any of the above-mentioned towns which serve as supply centers for the area.

Hotels and other accommodations
Hotel accommodations are available at Tyler, Longview, Gladewater, Henderson, Kilgore, and other nearby towns.

Schools and churches
Churches of all denominations are found in almost all of the towns near the field. Elementary schools and high schools are located in all of the towns. There are junior colleges at Longview and Kilgore.

Electric power and gas companies
All of the electric power and the gas used in the field as well as in nearby towns is obtained from old and long-established companies serving the large East Texas field and nearby towns. Gas for drilling fuel is obtained from wells in the field.

DEVELOPMENT

Early development
Hunt Oil Co., Dallas, Tex., 1 Bradley, in the approximate center of the Thomas Payne Survey, was completed on July 4, 1938, for 72.67 bbl. of 63-gravity distillate daily through ⅛-in. choke. The tubing pressure was 2,900 lb. and the casing pressure was 3,125 lb. The gas volume was measured at 850,000 cu. ft. daily. With a derrick-floor elevation of 471 ft., the well topped the pay in the Rodessa section of the Glen Rose at 7,340 ft. and was bottomed at 7,528 ft.

Oil-level discovery
Little development took place until late in 1939 when Shell 1 Campbell was started in the P. Lively Survey, 2½ miles north of the distillate discovery. The well was completed as an oil discovery for the field in the Pettit lime of the lower Glen Rose on February 27, 1940. After acid treatment the well made 870 bbl. of oil per day through ⅜-in. tubing under pressure of 655 lb. on the tubing and 1,500 lb. on the casing. The pay section was topped at 8,034 ft., or about 500 ft. below Hunt's distillate discovery well. The total depth of the new well was 8,600 ft., plugged back to the bottom of the first Pettit lime break at about 8,150 ft. The oil tested 42.2 gravity.

Third pay-level discovery
On June 28, 1940, Sun 1 Everhart, P. Lively Survey, about 2 miles southeast of the Shell oil discovery, was completed for 271 bbl. of 43.4-gravity oil, natural, per day, from the third and lowest break in the Pettit lime section. Pay was topped at 8,252 ft. and the hole was bottomed at 8,405 ft. Although the section was still the Pettit lime, it was an altogether different part of the section and was classed as a new producing horizon.

Fourth pay-level discovery
The fourth, newest, and shallowest pay level for the field was opened on October 10, 1940, when Sun-Shell 1 Mosely, Levi Hands Survey, about ¾ mile southeast of the Shell discovery oil well, was completed for 8.8 bbl. of 75-gravity distillate per hour through ⅜-in. choke from the lower Paluxy sand from 5,785 to 5,810 ft. Production was through 25 ft. of perforations after the hole had been plugged back from an original total depth of 8,276 ft. At the total depth a producer of 3 bbl. of distillate per hour could have been made of the well. This fourth level brought a total of two oil and two distillate horizons for the field.

Completions to date
Three oil wells. Six distillate wells.

Present drilling operations
There are three rigs running in the field. One location has been staked.

Present daily average production
No definite Railroad Commission order pertaining to allowables has yet been formulated; however, the three oil producers are making about 56 bbl. each, daily, or a total of about 168 bbl. Allowables of 150 bbl. daily, per well, have been requested by operators due to the depth and high drilling costs. There is no proration in Texas on distillate wells so long as waste does not occur.

Spacing pattern
A 40-acre spacing pattern has been adopted for the field. The Railroad Commission order that no proration tract of 40 acres shall be in length more than twice its width has a considerable effect in the field since the tracts are very small and irregular.

Present owners of producing leases
Hunt Oil Co., one distillate well; Sun Oil Co., one oil and three distillate wells; Shell Oil Co., Inc., two oil wells; Sun and Shell, two distillate wells; total, nine wells.

FUTURE DRILLING

Proven area
The present acreage embraced by the wells now drilled amounts to approximately 7,680 acres, the field's limits being about 6 miles in length and an average of 2 miles in width. Companies active in the field consider the entire 7,680 acres proven for gas or distillate production. No estimates have been made as to the possible proven oil acreage; however, the companies believe much of the area will ultimately be proven for oil as well.

Undrilled locations in proven area
Based on the present limits of the field and including the wells already drilled but excluding possible spacing exceptions of which there will be probably many, there are 183 undrilled locations, provided the 40-acre spacing rule is followed.

GEOLOGY

Method of discovery
Surface geological work played the most important part in the field's discovery, as there were definite formation-outcrop indications of a large anticline in the area. Most surface work was done about 10 to 12 years ago and about 9 to 10 years ago some core drilling was done by both Sun and Shell Oil Co., Inc., at which time these two companies started blocking in the area. The discovery well was backed by both the Sun Oil Co. and Shell Oil Co., Inc.

Geology of the field
The field is located on a very prominent elongated anticline with a north-south axis and a slight south pitch. There is an estimated 100 to 150 ft. of closure on subsurface members or forma-

tions. The structure is believed to be some 8 to 10 miles in length and approximately 3 to 5 miles in width. Its origin is attributed to possibly a deep-seated salt dome such as at the Van field, in Van Zandt County. There is, based on the present drilling done in the area, a more gradual drop off of the north end of the structure than off of the south. The surface formation outcropping in the field is the Queen City sand of the Mount Selman formation of the Claibourne group of Eocene age. The producing series in all of the wells in the field is the Lower Cretaceous Trinity. A rough geological section of the Trinity group is presented below.

Paluxy
Glen Rose
- Upper
- Middle or anhydrite
- Lower or Rodessa section
- Pettit lime
  - First break
  - Second break
  - Third break
- Travis Peak.

DRILLING CONDITIONS

Type of equipment used

All wells to date have been drilled with heavy-duty steam rotary rigs using gas for fuel. The great amount of gas produced in the field is utilized for drilling fuel.

Water in the field

There are a few shallow water sands which are cased off with the surface string. Water for drilling is obtained by drilling separate wells to these shallow sands.

Casing program

A complete casing program has not yet been adopted for the field. To date the following plan is followed: The 13⅜-in. casing is set at about 190 ft. There is about 4,420 ft. of 9⅝-in. set on top of the Georgetown lime. This string is to prevent gas in the lower zones from backing up and entering the Woodbine sand which is encountered a short distance above the Georgetown. No gas-pressure troubles have been found and operators are planning subsequently to omit this string.

Completion practices

Tubing is run to the top of the pay and the wells are completed and equipped with high-pressure christmas trees.

Speed in drilling

The first few wells drilled required about 4 months. However, the time has now been cut to approximately 2 months for the 8,000-ft. holes and appreciably less for the shallowest 5,700-5,800-ft. Paluxy zone.

Drilling problems

The drilling is fairly easy down to 4,400 ft. which is the approximate top of the Georgetown lime. From this depth on down it is almost solid lime, with only the sandy Paluxy break and a few sand breaks in the Rodessa and Pettit sections.

Cost of drilling

Wells in the field cost from $75,000 to $80,000, completed.

PRODUCING PRACTICES

All wells are flowing through tubing and high-pressure separators are hooked to all wells.

GENERAL PHYSICAL DATA

Average for wells from both breaks in Pettit section

Tubing pressure, 2,600 lb. Casing pressure, 2,685 lb.

Average for distillate wells in Rodessa section

Tubing pressure, 2,900 lb. Casing pressure 3,125 lb.

Average for distillate wells in Paluxy section

Tubing pressure, 1,400 lb. Casing pressure, 1,475 lb.

ANALYSIS OF REPRESENTATIVE SAMPLE OF CRUDE OIL FROM CHAPEL HILL FIELD

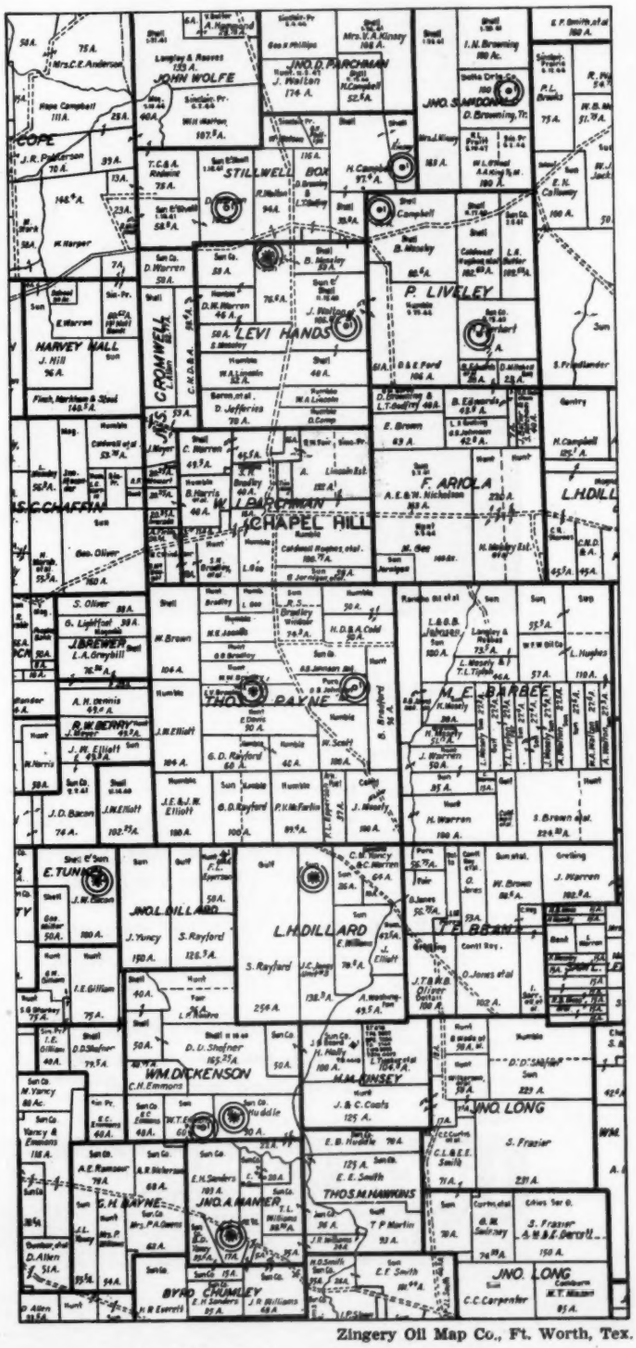
Gravity, °A.P.I.	43.4
Paraffin, per cent	2.90
Sulfur, per cent	0.38
Gasoline (Int.-410°), gravity 62.6° A.P.I., per cent	38.75
Kerosene (410°-530°), gravity 43.9° A.P.I., per cent	15.50
Heavy gas oil (530°-600°), gravity 39.4° A.P.I., per cent	5.75
Bottoms, per cent	39.10
Loss, per cent	0.90

ANALYSIS OF REPRESENTATIVE SAMPLE OF DISTILLATE FROM CHAPEL HILL FIELD

Gravity, °A.P.I.	62.8
Paraffin, per cent	.04
Sulfur, per cent	0.01

ENGLER DISTILLATION

	°F.
Initial	100
5 per cent	130
10 per cent	150
20 per cent	183
30 per cent	210
40 per cent	236
50 per cent	260
60 per cent	292
70 per cent	330
80 per cent	383
90 per cent	470
95 per cent	544
End point	562
Per cent over	95.5
Residue, per cent	2.0
Loss, per cent	2.5



Zingery Oil Map Co., Ft. Worth, Tex.

Map of Chapel Hill field, central Smith County, eastern Texas

ALTER EGO: Literally "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

ALTER EGO: How many have offered you a "good-as-Fleetweld" rod . . . and are they confessing or bragging?

Well, here's the third different welding rod proposition that lays eloquent emphasis on the claim that it's as good as "Fleetweld." *That's stimulating.*

ALTER EGO: No, it's emulating. Emulation admires and strives to imitate great actions. It's a human trait.

That prompts me to ask myself—"Why is 'Fleetweld' taken as the standard of welding electrode comparison?"

ALTER EGO: Maybe Lincoln can give us the FACTS and we can judge for ourselves.

• •

LINCOLN SUGGESTS: To find out why "Fleetweld" is the standard of comparison for welding quality and economy, TRY IT! Compare it to other electrodes. In what ways? See the 30-Point Check Chart on Page 5 of the New "Weldirectory." This 56-page procedure guide (gratis) gives all the FACTS about 37 Lincoln Electrodes for welding and hard-surfacing—where to use them—how to use them—what weld properties to expect.

LINCOLN "SHIELD-ARC" WELDING THE LINCOLN ELECTRIC COMPANY Cleveland, Ohio

Largest Manufacturers of Arc Welding Equipment in the World

Refinery Expansion

Pennsylvania Refining Company Changes Name to Wolf's Head

OIL CITY, Pa.—The name of the Wolverine-Empire Refining Co. has been changed to Wolf's Head Oil Refining Co., A. W. Scott, vice president and secretary, has announced. The change was made, Mr. Scott said, to reap the advantage of the public's familiarity with the "Wolf's Head" brand of motor oils and aviation lubricants which the company makes. With the change of the name, the old title "Empire" passes from association with the refinery, the name by which it has been known since the founding of the concern.

The company is one of the oldest, if not the oldest, Pennsylvania refinery in operation, Mr. Scott said. It was founded in 1879 by A. L. Confer, under the name of the Empire Oil Works. In 1919 the name was changed to Empire Oil Works, Inc. In 1929 the concern was combined with the Wolverine Lubricants Co., of New York, a marketing concern, which handled "Wolf's Head" oils. Empire products were formerly branded "Penn-Empire." Since 1929 the products have been sold under the "Wolf's Head" brand. E. W. Chase, Oil City, is president of the company; A. W. Scott, Oil City, vice president and secretary, and C. H. Ellingwood, of New York, chairman of the board.

About the first of the year the offices of the company will be moved from Reno, Oil City suburb, where the refinery is located, to an office building in Oil City, which is being remodeled for that purpose. The company is making improvements to the plant and is erecting a larger laboratory at the refinery to replace one destroyed by fire about 3 months ago.

Tulsa-Philadelphia Pipe Line Shipments Considered by Gulf

Gulf Refining Co. is considering plans for moving crude oil, having special value as lubricating-oil stock, from its main-line station at Glenn pool, Oklahoma, near Tulsa, to the company's refinery at Girard Point, Pa., near Philadelphia. According to the plans which have been discussed, shipments will be made by a hookup which includes the lines of Oklahoma Pipe Line, Ajax, Southwest Pennsylvania, Southern, Pure, and National Transit. At present this hookup is part of a system which supplies Atlantic Refining Co. at Point Breeze, Pa., near Philadelphia. A special river crossing will be required to move the oil from the Point Breeze terminal to the Gulf Plant at Girard Point.

Texas Co. Operating New Catalytic Poly Unit at Casper Refinery

CASPER, Wyo.—Texas Co. has completed and placed in operation its new 1,000,000-cu. ft. gas capacity U.O.P. catalytic polymerization plant at its refinery here. The new unit effects a 2 to 3 per cent increase in liquid gasoline recovery per barrel of crude oil processed, and utilizes 40 per cent of the still gases. The plant was constructed by Texas Co. labor with E. A. Erickson, plant engineer, in charge of construction under the supervision of P. Beall, assistant superintendent for Texas at Casper. L. F. J. Wilking is superintendent of the refinery, which has a crude capacity of 7,000 bbl. daily and a cracking capacity of 7,200 bbl.

Louisiana Refinery Being Guarded by State Police

BATON ROUGE, La.—State police have placed a 24-hour guard around the refinery here of the Standard Oil Co. of Louisiana. Steve Alford, state police superintendent, a member of the state's national-defense council, said company officials had agreed the plant, an important source of aviation gasoline, should be closely guarded against possible sabotage.

Natural Gas

Large Well to Furnish Gas for Repressuring Texas Pools

ABILENE, Tex.—E. H. Besse, of Kittery Oil Co., Casper, Wyo., has announced the firm will build a 4-in., 14-mile pipe line to handle gas for repressuring work in the Bluff Creek, Cook, and other pools of west Shackelford County. The line will run from Kittery Oil Co. et al 1 Hendrick, A.B.&M. Survey, gas well to the northwest, finished some time ago for 9,000,000 cu. ft. daily from 1,600-ft. sand. Gas for present repressuring work has been furnished by Lone Star Gas Co.

Gas Association Offers Prizes For Papers on Gas as Fuel

NEW YORK.—Prizes totaling $225 are offered by the American Gas Association, under plans announced by R. S. Child, chairman, committee on personnel practices, for the best papers on the subject "How I Would Increase Public Acceptance of Gas as the Ideal Domestic Fuel." The contest is open to all employes of member gas companies of the association. Two prizes will be awarded—the first prize will be $150 and the second $75. Papers must be the original work of the author or authors, prepared exclusively for this competition. No limitation is established as to length.

The contest closes May 1, 1941, and all entries should be submitted by that date to the committee on personnel practices, American Gas Association, 420 Lexington Avenue, New York. Detailed information covering the contest rules may be obtained from the secretary, American Gas Association, at the above address.

News of Pipe-Line Activity, which was formerly found on this page, will be found on Pages 58-59.

Texas Commission Order Defines Sweet-Gas Wells in Panhandle

AUSTIN, Tex.—The Texas Railroad Commission last week issued an order applying to the Panhandle field, but apparently applying to the entire state, fixing a method of classifying sweet and sour-gas wells. Its immediate effect will be to close some 100 wells in the Panhandle.

The order resulted from a hearing held in Austin recently at which it was testified that some of the wells on the commission's sour-gas schedule were producing sweet gas which was being used in the manufacture of carbon black. Therefore to fix a method for determining what constitutes each the new order states that "all wells producing natural gas containing less than 1½ grains of hydrogen sulfide per 100 cu. ft. and less than 30 grains of total sulfur per 100 cu. ft. of gas be and are hereby classified as sweet-gas wells, and the operators of such wells are hereby ordered to use the gas produced from them for purposes provided by statute for sweet natural gas."

Gas Utility Revenues Gain 6.5 Per Cent in September

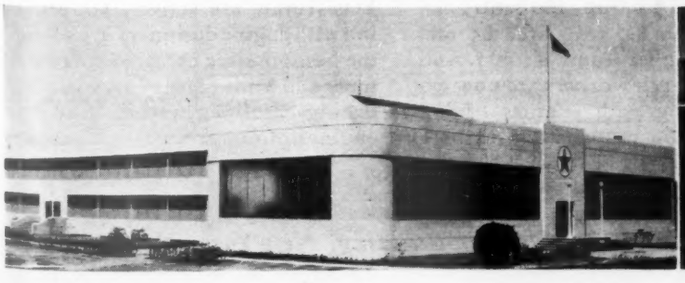
NEW YORK.—Revenues of manufactured and natural-gas utilities amounted to $58,713,400 in September 1940, as compared with $55,122,000 for the corresponding month of 1939, an increase of 6.5 per cent, it was announced by Paul Ryan, chief statistician of the American Gas Association. Revenues from industrial and commercial users rose from $20,207,300 a year ago to $21,734,500 in September 1940, a gain of 7.6 per cent. Revenues from domestic uses such as cooking, water heating and refrigeration, etc., were $36,978,900 for September 1940, as compared with $34,914,700 a year ago, an increase of 5.9 per cent.

The manufactured-gas industry reported revenues of $29,609,000 for the month, an increase of 4 per cent from the same month of the preceding year.

The natural-gas utilities reported revenues of $29,104,400 for the month, or 9.2 per cent more than for September 1939. Revenues from sales of natural gas for industrial purposes increased 7.5 per cent, while the increase in revenue from sales for domestic purposes was 10.5 per cent.

EMPLOYES PROVIDED WITH MANY COMFORTS IN PORT ARTHUR REFINERY OF TEXAS CO.

A visitor at the Port Arthur, Tex., refinery of Texas Co. is most favorably impressed by the new recreation and locker building. Built along modern lines as may be seen from the accompanying picture of the exterior, the structure provides a room (right picture) across the front 50 ft. wide and 150 ft. long. This may be used as an assembly hall, reading room or recreation room. It may be used for family dancing or plant parties as the occasion might require. The room seats 1,250 persons. In its routine use it is most popular as a place to play dominos and checkers. The rear of the building is divided into two sections, each including a series of lockers and showers. In all there are 3,430 lockers and 200 showers. In addition the men are provided with wash bowls at the end of each row of lockers. The concrete floor, glass shower partitions and smooth painted walls and ceiling promote a high degree of sanitation. Forced draft supplies ample air at all times. Another feature of the building is the use of light-deflecting glass in the large windows in the recreation room.



New Cars Reflect

1941 MODELS SHOW CONTINUATION OF TREND IN ENGINE DESIGN TO UTILIZE HIGHER ANTI-KNOCK GASOLINE

THE MARKED INCREASE in the compression ratios of 1941 cars —the sharpest rise in five years—is ample evidence that automobile manufacturers are keeping pace with advances in gasoline anti-knock quality. The compression ratios for all makes and models of 1941 cars average 6.66 to 1, as against 6.43 to 1 for 1940. At least twenty-five of the new models have higher compression ratios than they did last year, and some manufacturers who have not increased their already high compression ratios have made other changes in engine design to obtain additional horsepower from today's greatly improved fuels.

How closely increases in engine efficiency have paralleled gains in gasoline anti-knock value in recent years is shown in Figures 1 and 2. Improvements in motor fuel have made it possible for automotive designers to stress efficiency rather than size—a trend which in all likelihood will continue. Future developments in automotive engine designs will probably follow lines already successfully established in both automotive and aviation practice: the improvement of performance and fuel economy through further increases in compression ratios or by supercharging or both.

Figures 3 and 4, based on laboratory tests made on a 1940 model vehicle, show the gains in fuel economy, car speed and acceleration made possible by simultaneously raising the compression ratio from 6.1 to 1 to 8.6 to 1 and the fuel octane number from 78 to 95. And Ethyl research workers are now experimenting with engines having compression ratios above 11 to 1 and requiring fuel of over 100 octane number. Tests with supercharged engines also are being conducted. (Fig. 5.)

Engines and fuels are so closely related that their development is a joint responsibility of the automotive engineer and the petroleum technologist. Through their cooperative efforts, suitable fuels of higher anti-knock quality will be produced economically for engines which will utilize them with greatest efficiency.

We of the Ethyl Gasoline Corporation, through our research laboratories in Detroit and San Bernardino, are actively cooperating with engine designers in making the best possible use of tomorrow's fuels and with fuel refiners in producing gasolines best suited to the engines of tomorrow.

ETHYL GASOLINE CORPORATION, *Chrysler Building, New York, N.Y.*

t Progress in Fuels

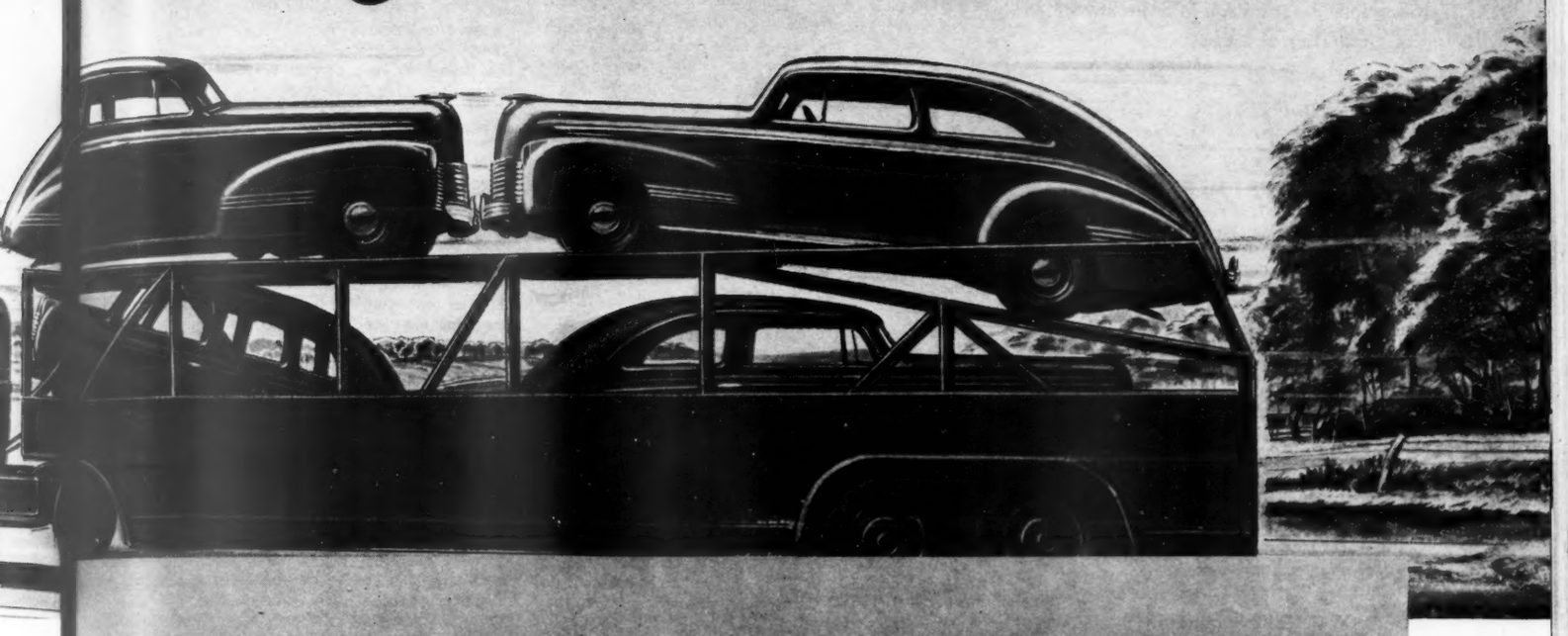


FIG. 1 (*below*) Octane numbers of automotive fuels have risen steadily over the past ten years. It is interesting to note that the regular gasoline being marketed today is superior in anti-knock quality to the premium gasoline of 1933.

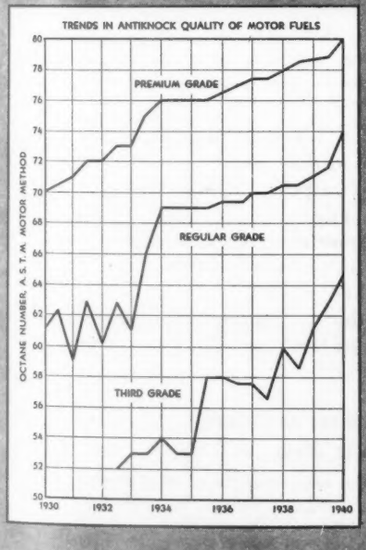


FIG. 5 (*right*) In laboratory tests on an eight-cylinder valve-in-head engine, supercharging to the limit permitted with 90 octane gasoline resulted in maximum brake horsepower of 145, as compared with 80 horsepower and an octane number requirement of 78 unsupercharged. Specific fuel consumption was substantially unchanged by supercharging.

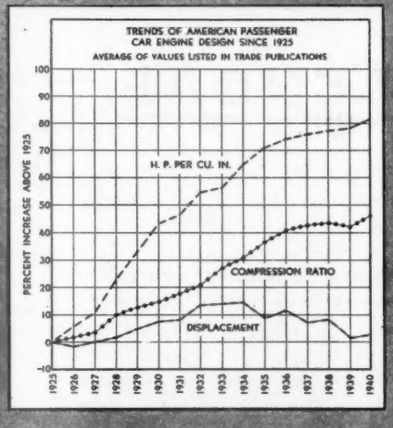
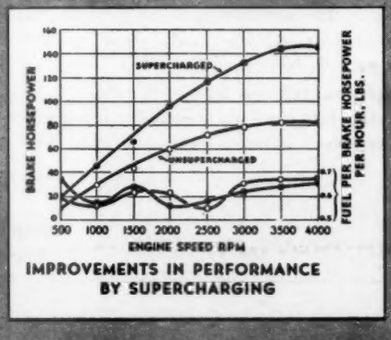


FIG. 2 (*above*) The trend of American passenger car engine design has stressed efficiency rather than size. The development of fuels of higher anti-knock value will permit designers to continue to improve the efficiency of their engines.



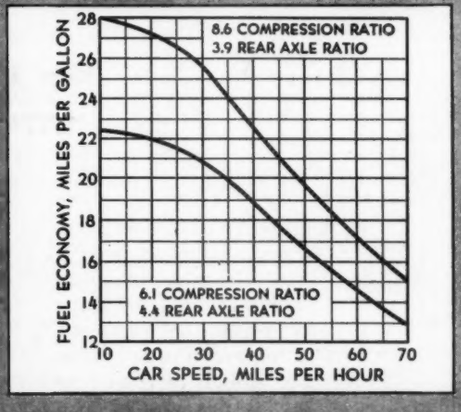

FUEL ECONOMY, MILES PER GALLON
8.6 COMPRESSION RATIO
3.9 REAR AXLE RATIO
6.1 COMPRESSION RATIO
4.4 REAR AXLE RATIO
CAR SPEED, MILES PER HOUR

FIG. 3 (*above*) Fuel economy of a 1940 model vehicle at 6.1 compression ratio and 4.4 rear axle ratio compared with fuel economy at 8.6 compression ratio and 3.9 rear axle ratio. Maximum power ignition timing was used with each compression ratio. Accelerating ability at 8.6 compression ratio and 3.9 rear axle ratio is equal to that of the other combination at low speeds and is much better than the other at high speeds.

IMPROVEMENT IN FULL THROTTLE ROAD PERFORMANCE OF A 1940 MODEL CAR WITH 8.6 COMPRESSION RATIO AS COMPARED WITH THE SAME CAR WITH 6.1 COMPRESSION RATIO

ALL DATA OBTAINED WITH SPARK ADVANCE FOR MAXIMUM PERFORMANCE AND WITH A 4.4 REAR AXLE RATIO

ACCELERATION ON LEVEL ROAD	PERCENT IMPROVEMENT
10 TO 30 M. P. H.	17.2
10 TO 60 M. P. H.	18.0
ACCELERATION ON 11.6 % GRADE	
TIME REQUIRED TO CLIMB GRADE	25.8
SPEED AT TOP OF GRADE	67.6
TOP SPEED	5.4

THE FUEL OCTANE NUMBERS FOR "TRACE" KNOCK WITH 6.1 AND 8.6 COMPRESSION RATIOS WERE 78 AND 95 RESPECTIVELY

FIG. 4

PROGRAMS AND MEETINGS

Complete Program for Mid-Continent Oil Gathering at Tulsa

The standing tax committees of the Mid-Continent Oil and Gas Association will hold their annual tax luncheon at noon on Friday, December 6, at Tulsa, during their annual joint meeting, at which time the assembled petroleum tax representatives will be addressed by Hon. Leon C. Phillips, governor of Oklahoma. The general oil public is invited to be present.

With the addition of a nationally known speaker on payroll taxes, the program of speakers with regard to federal tax matters is now complete. George Guth, Socony-Vacuum Oil Co., Inc., Washington, D. C., will address the meeting on the subject of "Trends in Social Security," at 11 a.m., on Thursday, December 5.

Dr. F. H. Guild, director of the research department, of the Kansas Legislative Council, will address the annual meeting at 4 p.m., on Thursday, December 5, with regard to "The Kansas Revenue System." In his discussion of the Kansas revenue system, Dr. Guild will, among other things, touch on the various tax code revisions which have been proposed to the Kansas Legislative Council.

Other features of the annual joint meeting of the association's standing tax committees will include the president's address by J. C. Hunter, president, Mid-Continent Oil and Gas Association, at 10:30 a.m. on Thursday morning, December 5.

I.P.A.A. Will Hold Sectional Meeting at Wichita Falls, Tex.

The Independent Petroleum Association of America will hold a sectional meeting at Wichita Falls, Tex. December 9, the first session of its kind ever held in the North Texas district.

Russell B. Brown, Washington attorney for the I.P.A.A., will be the principal speaker. He will address oil operators on the wage-hour problems and other problems of intimate concern to the industry. H. B. Fell, of Ardmore, Okla., executive vice president of the association, will also be a speaker. John F. O'Donohoe, of Wichita Falls, member of the executive committee, will act as toastmaster at the dinner meeting.

A.I.M.E. Meeting Held In Kilgore, Tex.

On Tuesday evening, December 3, Julius D. Madaras, of Detroit, Mich., explained the process of "Iron Ore Reduction by the Use of Natural Gas," to the East Texas section of the American Institute of Mining and Metallurgical Engineers. A plant to commercially produce iron ore from the East Texas red beds is being planned at this time. Mr. Madaras is the inventor of the process which has already proved feasible by experiments.

In addition, R. W. Wilson, of the Baroid Well Logging Service, Houston, Tex., spoke on the subject of well logging, using a series of slides illustrating the equipment and the method used in making the surveys. A motion picture with sound titled "Bridging San Francisco Bay" was shown.

W.P.R.A. Meeting at El Dorado, Ark., To Hear Paper on Varnish

Final in the 1940 series of technical group meetings of the Ark-La-Tex division of Western Petroleum Refiners Association will be held on Friday, December 6, at the Randolph Hotel, El Dorado, Ark., beginning at 4 p.m. The special feature of this meeting will be a paper entitled, "Engine Varnish as Influenced by Lubricating Oil," by J. H. Baird, of Lubri-Zol Sales Co., Cleveland, Ohio.

Colored lantern slides will be used to illustrate typical engine "varnish" conditions, corrective methods, and improvements now made possible by the newly developed oils. It is also expected that Mr. Baird will include in his paper some interesting facts pertaining to airplane lubrication. A round-table discussion will follow the paper.

East Texas A.P.I. Chapter To Meet in Kilgore

The East Texas chapter A.P.I. will hold a meeting in Kilgore High School auditorium, Kilgore, Tex., on December 10, at 8 p.m.

N. N. Jones, of the Humble Oil & Refining Co., will present a paper on the "Practical Use of Subsurface Measurements in the East Texas Field."

The report of the nominating committee, and chapter officers for the year 1941 will be elected at this meeting.

Dinner will be held at the Kilgore Hotel prior to the meeting. An unusual comedy act from Kansas City, Mo., has been engaged for the entertainment.

Lengthy Program for Next Safety Meeting

The next meeting of the Petroleum Safety Council will be held at 10:15 a.m., December 6, in the Junior Ballroom of the Hotel Mayo, Tulsa, according to L. C Barrett, Gulf Oil Corp., secretary-treasurer of the council. The program follows:

10:15—Business meeting.

10:30—"Personal Protective Equipment in Refinery." J. H. Savage, Mid-Continent Petroleum Corp. (*a*) Selection; (*b*) instruction in use; (*c*) inspection and maintenance.

11:00—Discussion.

11:15—"Fire Protecting Equipment on Production Properties," I. G. Clark, Gulf Oil Corp.

11:45—Discussion.

12:00—Luncheon.

1:00—"Personal Protective Equipment in Production," H. T. Markee, Phillips Petroleum Co. (*a*) Safety shoes; (*b*) hard hats; (*c*) goggles; (*d*) respiratory equipment.

1:30—Discussion.

2:00—"Use of Protective Equipment in Construction and Repair of Pipe Lines," E. K. Alexander, Texas Empire Pipe Line Co.

2:30—Discussion.

3:00—Adjournment.

CALENDAR

December

MID-CONTINENT OIL AND GAS ASSOCIATION, annual joint meeting of standing committee on state and local taxation, and standing committee on federal income and excise taxation, Hotel Tulsa, Tulsa, December 5-6.

INTERSTATE OIL COMPACT COMMISSION, quarterly meeting, Hotel Tulsa, Tulsa, December 6.

AMERICAN PETROLEUM INSTITUTE, Illinois Basin chapter, Southern Gardens, Salem, Ill., December 6.

SIGMA GAMMA EPSILON, national geological fraternity, symposium on Pennsylvanian of Texas, Oklahoma, and Kansas, Business Administration Building, University of Oklahoma, Norman, Okla., December 7.

NATIONAL ASPHALT CONFERENCE, Adolphus Hotel, Dallas, Tex., December 9.

NATIONAL CHEMICAL EXPOSITION, Stevens Hotel, Chicago, December 11-15.

PETROLEUM ELECTRIC POWER ASSOCIATION, Heidelberg Hotel, Baton Rouge, La., December 12-13.

MID-CONTINENT OIL AND GAS ASSOCIATION, annual meeting of general board of directors, Tulsa Club Roof, Tulsa, Okla., December 16.

1941

January

SOCIETY OF AUTOMOTIVE ENGINEERS, annual meeting and engineering display, Book-Cadillac Hotel, Detroit, Mich., January 6-10.

LIQUEFIED PETROLEUM GAS ASSOCIATION eastern section, regional meeting, New York, January 16-17.

NORTHWEST PETROLEUM ASSOCIATION, Radisson Hotel, Minneapolis, Minn., January 23-24.

Petroleum Chemists Will Meet at Ponca City

The Oklahoma section of the petroleum group of American Chemical Society will hold a meeting in the library clubroom, at Ponca City, December 7 at 3 p.m. The topic will be "Oxidation of Petroleum Lubricants," advises Bert H. Lincoln, chairman. The program follows:

1. "An Oxidation Absorption Test for Lubricants and Addition Agents," by G. D. Byrkit.

2. "The Underwood Machine and Other Laboratory Methods of Evaluating Lubricating Oils," by W. A. Jones.

3. "Effect of Engines on Oxidation Processes and of Oxidation Products on Engines," by L. L. Davis.

5:30 p.m.—Inspection of Cities Service and Continental laboratories.

6:30 p.m.—Dinner, cafeteria, Continental Associates Building. (Please buy tickets for dinner, 75 cents, from your local agent a week in advance if possible.)

7:30 p.m.—Ladies' night entertainment.

8 p.m.—"Chemistry's Challenge" (prepared especially for ladies' night), by Dr. Harrison Hale, head of the department of chemistry, University of Arkansas.

Mid-Continent A.S.M.E. and Tulsa Engineers in Joint Meeting

The Mid-Continent section of the American Society of Mechanical Engineers and the Tulsa Engineers Club will hold a joint dinner meeting December 9 at 5:30 p.m., at Michaelis Cafeteria. All Tulsa engineers, oil-company executives, and personnel desiring to attend the meeting are cordially invited.

The speaker for the occasion is to be E. E. DeBack, general superintendent of the Coastal Recycling Corp., the La Gloria Corp., and affiliated companies. The topic will be: "Operation and Design of High-Pressure Absorption-Type Distillate Recovery and Recycling Plants."

Mr. DeBack has supervised the construction of and is now operating several of the largest distillate plants in the world, several of which handle over 100,000,000 cu. ft. daily of recycling gas which is injected into formations after its hydrocarbon content has been stripped at pressures ranging from 200 to 3,500 lb. per sq. in.

Mr. DeBack was recently elected president of the American Recycling Association and is considered an authority in the field.

Mid-Continent Association Directors to Meet

The annual meeting of the board of directors of the general Mid-Continent Oil and Gas Association will be held December 16, in the roof room of the Tulsa Club, Tulsa. Directors will hear a review of the affairs and activities of the association, and reports of association officers and committees, including those on taxation, social-security matters, and wage and hour laws.

Officers for 1941 will be elected and the program and policies for the ensuing year will be formulated.

Magnetic Storm

TUCSON, Ariz.—Moderate storm began November 29, 4 a.m., and ended November 30, 11 a.m.

Directional drilling of holes has many benefits but it also increases the expense of drilling. In addition to wearing the drill pipe rapidly, the slanting holes throw an extra strain on the rotary table and swivel. Repairs are being made to this rotary table while pipe is setting in a directionally drilled hole. In the background can be seen the reel for running the survey instruments

ENGINEERING & OPERATION

In This Section

DECEMBER 5, 1940

Socony-Vacuum Finishes New York Gasoline Line

By PAUL REED

BUFFALO and Syracuse, N. Y., have been connected recently by a gasoline pipe line, constructed for Socony-Vacuum Oil Co., Inc., by O. C. Whitaker Co., Fort Worth, Tex. Shipment of refined products through the new line will displace the company's barge transportation on the Erie Canal in that area. The pipe line provides facilities for making regular deliveries at low cost throughout the year. This is the second gasoline line built by the company in eastern states; the other line delivers products from the Providence refinery to Springfield, Mass., and Hartford, Conn.

The Socony-Vacuum Oil Co., Inc.'s Buffalo-Syracuse line provides an outlet for the company's Buffalo refinery and consists mainly of 180 miles of 6-in., including 18 miles for the lateral to Rochester. In addition there are 16 miles of 4-in. pipe laid for short laterals to bulk stations. Each of these short laterals consists of two 4-in. lines laid in the same ditch. This double 4-in. system makes it possible to have separate lines for high and low-gravity products. The short laterals laid to bulk stations are of the following lengths: Weedsport, 3 miles; Batavia, 2½ miles; Geneva, 2½ miles. At the Syracuse terminal there are facilities for loading barges for delivery by canal to points beyond. At present, provision has been made for only one pump station, located at the Buffalo refinery.

The 6-in. pipe used for the line is seamless, high carbon, with a weight of 18 lb. per sq. in., delivered in random 40-ft. lengths. Altogether more than 50 gates were installed in the system. The construction program did not include installation of meters.

Work was started June 15 but it was held up for 30 days as the result of a complaint made to the attorney general of the State of New York by an attorney for railroad labor interests. After investigations it was found that the changes were not substantiated and construction was allowed o proceed. The main pipe-laying job did not get under way until September 1; it was completed about October 25.

The project has been supervised by C. W. Schaeffer, superintendent of the Socony-Vacuum Oil Co., Inc., refinery at Providence, R. I. He was assisted by George Bragence, chief engineer, who had been assigned to this undertaking by Magnolia Pipe Line Co., Dallas, Tex. The operations of the contractor, O. C. Whitaker Co., were directed by J. C. Britton, general superintendent. The superintendent directly in charge of the company's two spreads was Earl Hackleman. Stringing was contracted by C. Hobson Dunn.

The project is of interest because of the unusual nature of the terrain in the upper New York State where there will be more pipe-line construction in the near future. Furthermore, some original construction methods were adopted which represent distinct improvements in current practices. The most interesting of these is the bending of pipe by means of a special bending shoe attached to a tractor in the pipe gang.

Terrain

The pipe line traverses terrain which is glacial moraine or till, consisting of unsorted material ranging in size from the finest of silt to boulders 30 ft. or more in diameter, most of which are granites. These depositions are distinctly different from the uniform gravels that are encountered in the Southwest. Boulders on the right-of-way presented obstacles in ditching operations and at road crossings, especially over a 30-mile stretch in the vicinity of Batavia. It was necessary to do considerable handwork in connection with digging out and blasting boulders.

Altogether more than 360 railroads and highways were crossed. The Genesee River was crossed twice. Seven swamps, 3,000 to 10,000 ft. in width were crossed, the worst of these being the one near Montezuma. Timber on the swamps had been cut a month ahead of construction; this fact and the dry weather account for the swamp operations going ahead without undue delay.

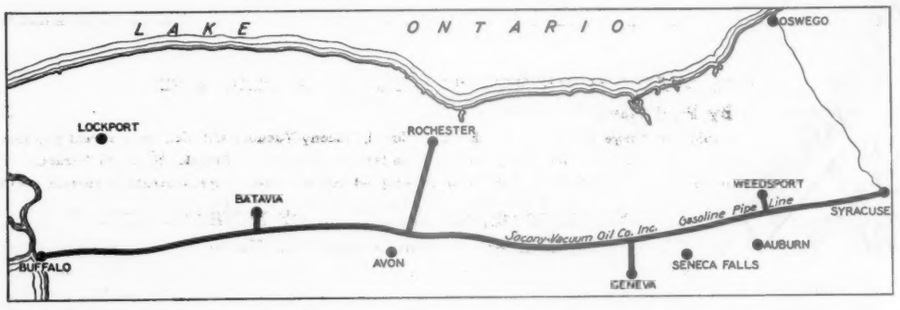
The aerial survey, made before the route was determined, showed that 5 per cent of the right-of-way was timbered. As in other modern pipe-line surveying, it was found that the aerial photographs made it possible to effect considerable savings by making it possible to select a route which would deviate to avoid rough places and areas where the pipe might be washed out later. This would add to the trouble and expense of maintaining the line. For a distance of 18 miles between Weedsport and Syracuse the line was laid along the bar pit of an abandoned interurban railway. The job also called for the crossing of a canal.

Road Crossings

Most of the crossings were made by the jabbing method which is generally employed in pipe-line construction. But where the crossings were unusually long or difficult, the contractor utilized a gasoline motor-driven road auger which had been built at his shop. This proved to be successful and decidedly profitable where difficulties warranted the extra expense for cutting an approach suited to this type of operation and for the installation of the mechanical equipment. At some road crossings, it was necessary to tunnel. In some cases, special permits were obtained, making it possible to cut the ditch through the road.

At one railroad crossing, quicksand was encountered. Boring was done by manual labor using the jabbing method. The walls of the bore hole were supported by casing which was shoved ahead during the boring operation. The front end of the casing was about 2 ft. ahead of the auger.

Where canals were crossed dredging was done so that the pipe would be laid 20 ft. below the surface of the water. Since the depth of the water was about 15 ft., dredging was done to a depth of 5 ft. below the bottom of the canal. There was little traffic on the canal to interrupt the work; on the other hand, there was a good deal of traffic on the highways.



Left: Route of main line and laterals of Socony-Vacuum's 180-mile 6-in. gasoline pipe line in New York

Below: Two welders tacking and running stringer beads in pipe gang. Two 200-amp. welding machines are carried on truck

The work of boring crossings and installing casing was done about 6 or 7 miles ahead of the pipe gang. Coated pipe was pulled through the welded casing at crossings by a crew working behind the dope gang. Coated pipe at crossings was protected by laths fastened to the pipe by wire. Vents were placed at road crossings. At highway crossings one vent was placed at the low side of the road. At railroad crossings a vent was placed on each side. A saving was effected in the expense for handwork on the job by having the approaches to crossings dug by power shovel.

Each of the two spreads which the contractor used for doing the work was organized and equipped on much the same lines.

With each spread there were two ditchers. In line with practice which has been widely adopted in the past 2 years, the contractor used a heavy ditcher and a light ditcher. The heavy ditcher is particularly valuable where ditching is hard. The light ditcher makes good time where the going is easy and it can be easily moved about on a trailer or lowboy. The contractor found that the work progressed satisfactorily with a heavy ditcher operating on the main line and the light ditcher on the laterals. With two ditchers it is possible to keep the work moving steadily forward, because, in case of the breakdown of one ditcher, there is another ditcher available to go ahead. Throughout the construction of this project, the contractor had ditching operations carried on 3 miles ahead of the pipe gang. The ditch was 18 in. wide and 28 in. deep.

Above: Two stages of bending pipe by means of specially designed bending shoe attached to side of tractor. With this device it is possible to do bending faster and with one less man than is necessary when bending is done in the ditch

Left: Gasoline motor-driven boring augur in operation at New York Central Railroad tracks. A winch line runs back to a winch mounted on a truck which holds the augur to the cutting face in the bore

Bending Shoe

In the pipe gang, one of the tractors made bends and laid pipe over the ditch a quarter of a mile ahead of the tractor used in connection with the operation of stabbing and running the stringer bead.

A unique feature of construction operations on this line was the use of the special shoe, attached to the side of the tractor for the purpose of facilitating the bending of the pipe. This shoe was invented by the O. C. Whitaker organization and its value was successfully demonstrated on this job. As can be seen by the photograph of bending operations, the shoe assembly is welded to the frame of the tractor at a point where it is directly below the apex of the boom. The assembly includes an arm extending outward and downward at an angle which makes it possible to hold the pipe securely at a sufficient distance to be clear of the tractor while bending is done. The shot, itself is held to this arm by a pin which makes it possible for the shoe to turn, so as to hold the pipe in the desired manner while the bend is made by the tractor's cable and winch. As the work progressed on this job it was found advisable to brace the arm of the bending-shoe assembly with two pieces of angle iron welded to it and the frame of the tractor; this bracing proved to be adequate. This bending shoe was used on the tractor of the western spreads; the eastern spread used a conventional procedure.

With this device, it is possible to avoid delays occurring in bending operations when a chain is used to hold down pipe when cold bending is done on the ground alongside the ditch. A fast, satisfactory method of bending pipe on the ground alongside the ditch has advantages over bending operations which are carried on when pipe in the ditch is bent by a tractor placed across the ditch. When pipe is bent in the ditch, there is likely to be caving which later requires hand labor for "crumbing out." Furthermore, when the ground is wet there is a change that a tractor placed across the ditch may be stuck.

Although the only trial of this device has been with the bending of 6-in. pipe, it is believed that it would handle 8-in. pipe. Equipment of the same type, fabricated for a heavier tractor, might be used for bending pipe as large as 12 in. It has been estimated that the use of this type of bending shoe has effected a saving of 25 per cent in time taken for bending operations during the construction of the Buffalo-Syracuse pipe line.

Welding and Coating

At the beginning of the job, a 5/32-in. rod was used for the stringer bead but it was soon found that faster and better work could be done by using a ⅛-in. rod for this part of the welding. A 5/32-in. rod was used for the second bead; a $\frac{5}{32}$-in. rod was used for the third bead. In the pipe gang of the spread on the eastern section of the line, two welders made the stringer bead; in the pipe gang at the western end of the line one tack welder worked ahead of two welders making stringer beads. Each spread used four or five welders to put on the finishing beads. During an average day 10,000 ft. of pipe was laid; the best day's record was more than 20,000 ft.

The line was coated throughout with an asphalt coating made at the Socony-Vacuum refinery at Buffalo. Coating was applied with a $\frac{1}{16}$-in. thickness; at road crossings a double thickness of coating was used. Asphalt was carried along the right-of-way in 9-bbl. pots. These were heated to a temperature of 200° F., which is comparatively low for coating operations. The pipe was wrapped only at canal and swamp crossings, and for a distance of 15,000 ft. on the outskirts of Buffalo as well as for a short distance near Syracuse.

Gates were installed behind the pipe gang and were coated along with the rest of the line. Creek crossings were dug with the dragline belonging to each spread. Back filling was done with bulldozer. No throw bucket was used. The contractor found it difficult to get skilled pipe-line labor in the area where the line was laid. Skilled men for this work were brought from Kansas, Oklahoma, and Texas.

Testing

The contract called for a 1,000-lb. hydrostatic pressure test on the completion of the work. There was no sectional testing during the course of construction of the line. Only one type of test was used for welding. A hydraulic pulling machine tested coupons cut from the pipe for tensile strength. The tensile strength of the pipe was 60,000 lb.; the welding rod used had a tensile strength of 80,000 lb.

Conclusion

The construction of this line is of interest as an example of the construction of a pipe-line project in eastern territory by a contractor with modern equipment, as well as improved methods and trained crews which have been developed to meet requirements of efficiency necessary in western oil states. It appears that this is just the beginning of a period of gasoline pipe-line construction which will be extensive in eastern states.

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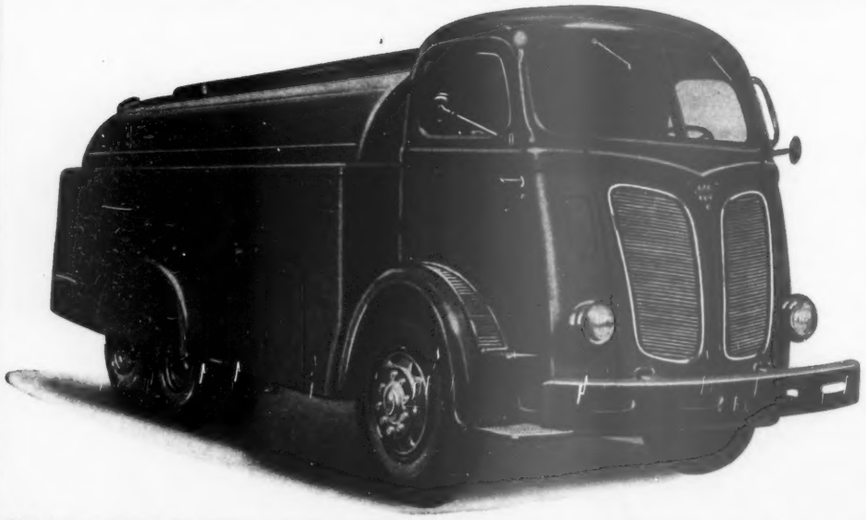

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Constitution Diagrams and Composition of

Methane and Ethane Hydrates

By O. L. ROBERTS, E. R. BROWNSCOMBE, and L. S. HOWE
Atlantic Refining Co., Philadelphia, Pa.*

GAS hydrates were discovered by Davy in 1810.[1] Several investigators worked on hydrates of various substances including Cl_2, Br_2, SO_2, CH_3Cl, NH_3, C_2H_2, CO_2, PH_3, H_2S, and others. Villard[2 3] made an extensive experimental study of gas hydrates, including decomposition curves for methane, ethane, and ethylene hydrates. De Forcrand[4 5 6 7 8 9] was the first to attempt the determination of the composition of the hydrates by thermodynamic methods. Recently, the study of gas hydrates has been reopened by Hammerschmidt,[10 12 15 16 17 18] whose work is primarily concerned with the prevention of hydrate formation in natural-gas lines by the addition of freezing-point depressants or by dehydration of the gas. Deaton and Frost[11 13 14 19] have studied decomposition curves for a number of natural gases as well as for methane, ethane, and propane and mixtures of methane with various concentrations of other hydrocarbons.[19]

The present paper is concerned with the relation of the usual hydrate curve to the other equilibria curves for the water-methane and water-ethane systems. Use of the vapor-ice-hydrate data as well as the vapor-liquid-hydrate equilibrium, together with the incorporation of the compressibility factor of the gas makes possible a thermodynamically sound method of calculating hydrate composition.

Apparatus

Fig. 1 is a diagram of the apparatus used to study gas hydrates. It consisted of a glass reaction tube 3 mm. inside by 10 mm. outside diameter, mounted on a steel block by means of a packing gland. The system was filled with mercury and pressure exerted in the mercury reservoir from a nitrogen cylinder. The pressure on the system was indicated by suitable pressure gages attached to the block. The entire system was constructed of stainless steel to eliminate corrosion.

The reaction tube was charged or exhausted through fine stainless-steel capillaries which could be introduced into the reaction tube through a curved housing. Individual capillaries were provided for charging water or gas and for exhausting the tube. The capillaries were connected to $\frac{1}{16}$ by $\frac{1}{16}$-in. stainless-steel tubes which were brought out of the system through packing glands.

The contents of the reaction tube were agitated by moving a stainless-steel wire up and down the tube. This was accomplished by leading the wire out of the tube through a curved housing to a straight piece of stainless-steel pipe. The wire was attached to a soft iron core in this pipe. Surrounding this pipe was a movable magnetic coil which, when energized, would move the iron core and attached wire as desired.

Provision was made for removing dissolved gases in the charge water by freezing and evacuating in the water reservoir. The water was charged to the reaction tube by displacement with mercury. The gas reservoir was evacuated before being charged. The gas was charged to the reaction tube under its own pressure or by displacement with mercury.

Procedure

The methane used in this study was prepared by distilling methane from a mixture of low-boiling hydrocarbons, which contained about 90 per cent methane. The portion of the methane cut, from the distillation, from 16 to 67 per cent was used. The purity of the methane was 99.9 per cent. The ethane employed was subjected to a low temperature fractional distillation and was found to contain 99.5 per cent ethane and 0.5 per cent of C_3 and heavier hydrocarbons. The water was distilled and deaerated before use.

After thoroughly cleaning and evacuating the apparatus, the water-introducing capillary was forced in and a small amount of deaerated distilled water injected. After removal of the capillary the exact quantity of water was measured by a cathetometer. Another capillary was then inserted and hydrocarbon gas added, the amount added being determined by the pressure, temperature, and volume occupied by the gas. The temperature of the bath around the tube was adjusted and the pressure raised above the hydrate formation curve. It is well known[11] that hydrates may not form even though the pressure is 300-400 lb. above the decomposition pressure. Even violent agitation failed to initiate hydrate formation when the pressure was only slightly above the equilibrium value.

After starting hydrate formation, the pressure was dropped to a value close to the equilibrium curve and the variation of volume with time noted at this constant pressure. If this pressure was slightly above the equilibrium value, the volume gradually decreased due to hydrate formation, conversely if this pressure was below the equilibrium value the volume increased. This permitted equilibrium to be approached with equal facility from either side, in the presence of hydrate. The procedure was applicable either to the vapor-liquid-hydrate or to the vapor-ice-hydrate equilibrium, but, of course, could not be used on

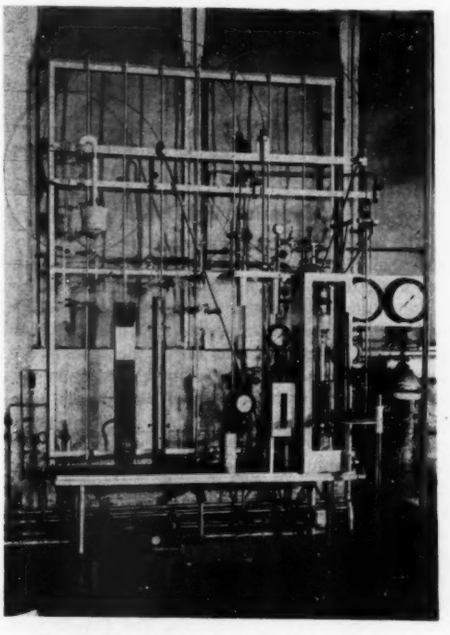


Fig. 2—Photograph of gas-hydrate apparatus

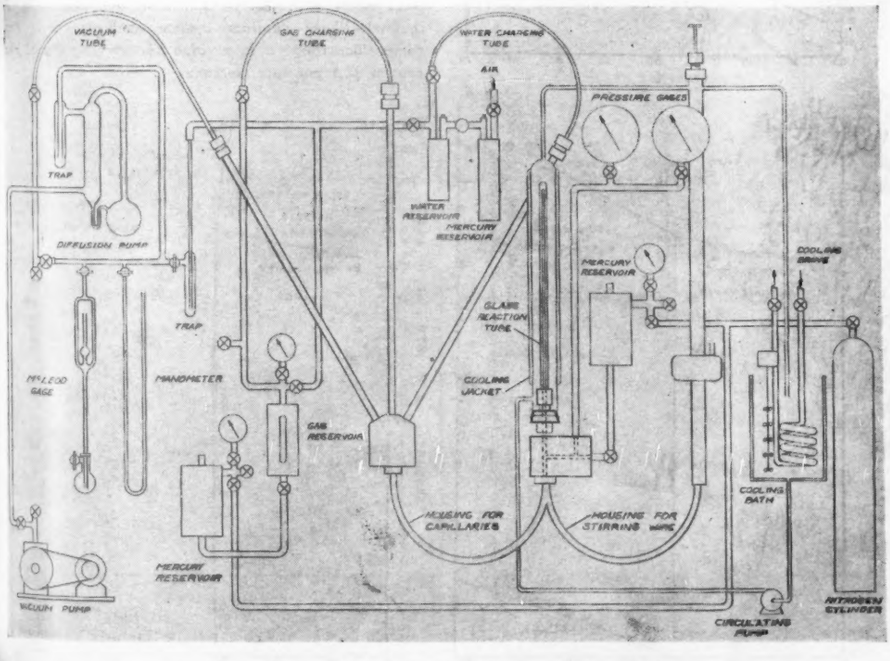
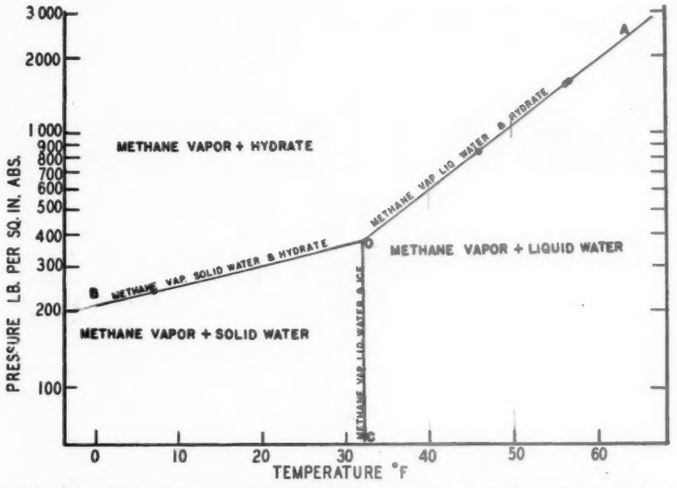


Fig. 1—Diagram of apparatus used in gas-hydrate study

*Paper was presented before first annual meeting of the American Recycling Association, held in November at the Texas College of Arts and Industries, Kingsville, Tex.


METHANE VAPOR + HYDRATE
METHANE VAP LIQ WATER & HYDRATE
METHANE VAP SOLID WATER & HYDRATE
METHANE VAPOR + LIQUID WATER
METHANE VAPOR + SOLID WATER
METHANE VAP LIQ WATER & ICE
PRESSURE LB. PER SQ. IN. ABS.
TEMPERATURE °F

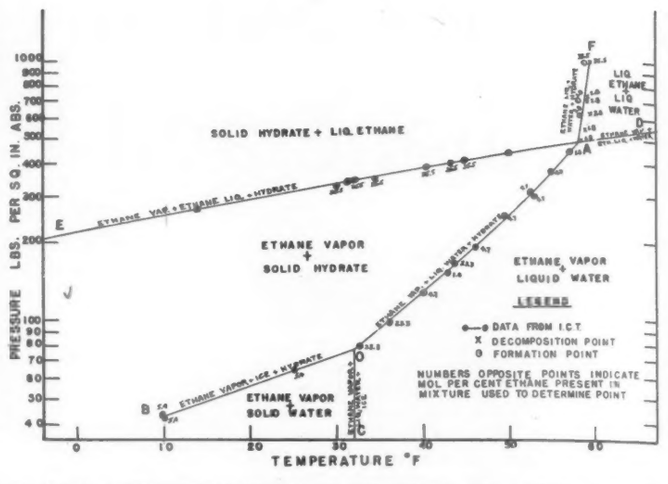

SOLID HYDRATE + LIQ. ETHANE
ETHANE VAP + ETHANE LIQ + HYDRATE
ETHANE VAPOR + SOLID HYDRATE
ETHANE VAPOR + LIQUID WATER
ETHANE VAPOR + SOLID WATER
ETHANE VAPOR + ICE + HYDRATE
LIQ. ETHANE + LIQ WATER
LEGEND
DATA FROM I.C.T.
DECOMPOSITION POINT
FORMATION POINT
NUMBERS OPPOSITE POINTS INDICATE MOL PER CENT ETHANE PRESENT IN MIXTURE USED TO DETERMINE POINT
PRESSURE LBS. PER SQ. IN. ABS.
TEMPERATURE °F

Fig. 3 (left)—Phase diagram—system methane-water: For composition range 12.5 mol per cent to a value approaching 100 per cent methane. Fig. 4 (right)—Phase diagram—system ethane-water: For composition range 12.5 mol per cent to a value approaching 100 per cent ethane

the condensed system liquid water-liquid ethane-hydrate. For this reason data on the last-mentioned equilibrium are not as reliable as the data for the first two. This is indicated in Fig. 4 by the spread between the formation and decomposition temperatures defining the equilibrium curve for liquid water-liquid ethane-ethane hydrate.

Experimental Data

The experimental data for methane hydrate are given in Fig. 3 and Table 1. The curve *OA* represents the usual decomposition curve obtained for equilibrium between methane gas, liquid water and solid hydrate. The curve *OB* has not been previously investigated, as far as the authors are aware. It represents the equilibrium between methane gas, ice, and hydrate: no liquid was present in the mixture when points on this type of equilibrium were obtained. The curve *OC* represents the equilibrium between water and ice in the presence of methane gas. It is essentially the ordinary curve for the change in freezing point of water with increase in pressure.

Fig. 4 and Table 2 show the experimental data for ethane. The curves *OA*, *OB*, and *OC* represent equilibria of the same type shown for the corresponding curves for methane. The liquefaction of ethane, however, introduces three new curves. The curve *AE* represents the equilibrium between liquid and vapor ethane in the presence of ethane hydrate. The solid circles, representing data taken from the International Critical Tables, show that this curve is identical with the vapor-pressure curve for pure ethane, as would be expected. The vapor pressure of ethane in the presence of liquid water is shown by curve *AD*, which is an extension of curve *AE*. At the point *A* a slight increase in pressure causes the disappearance of the vapor phase, and we have the system liquid water-liquid ethane-ethane hydrate.

As might be expected the effect of pressure on this condensed system is very slight, resulting in the steep rise of curve *AF*. The over-all composition of the mixture used is given beside each experimental point. In accordance with the phase rule, the equilibrium was the same regardless of composition as long as no one phase disappeared. Also, the proportion of hydrate present could be increased from a trace to an amount which used up practically all the water, or the hydrocarbon, without appreciably affecting the equilibrium pressure. This confirmed the purity of the gases.

The equilibrium pressures for vapor-liquid-hydrate (curves *OA*) for methane and for ethane are compared with values obtained by Villard and Deaton and Frost in Fig. 5. As is shown in the diagram, the agreement is very close in all cases.

A phase diagram for a mixture of 12½ mol per cent methane, which is shown below to be the composition of the hydrate, is given in Fig. 6. Starting in the region liquid water plus vapor and increasing the pressure isothermally, under suitable conditions, the vapor begins to combine with the water to form hydrate when the curve *OA* is reached. As long as three phases (vapor-water-hydrate) are present, more and more hydrate can be formed without any change in pressure or temperature. Since the composition of the system is that of the hydrate, the last trace of hydrate to form will consume all the water and all the vapor simultaneously, leaving only hydrate above the curve *OA*.

Starting again in the region water plus vapor and isobarically reducing the temperature, ice will form at the freezing point of water, along *OC*. The liquid phase will completely disappear at this temperature leaving solid water plus vapor. If the pressure is now increased at constant temperature, hydrate will begin to form from ice and vapor when curve *OB* is reached, under suitable conditions. Again both phases will be exhausted at the same time and above this curve only hydrate exists.

If an excess of water is present (Fig. 7), some of it will be left over in the form of liquid water or ice when the curves *OA* or *OB* are crossed as pressure is increased. Curve *OG* shows the point of change of this excess water from liquid to ice

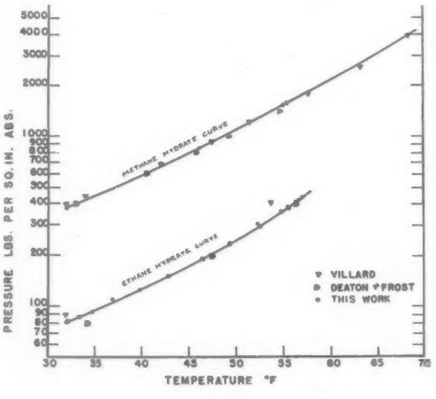
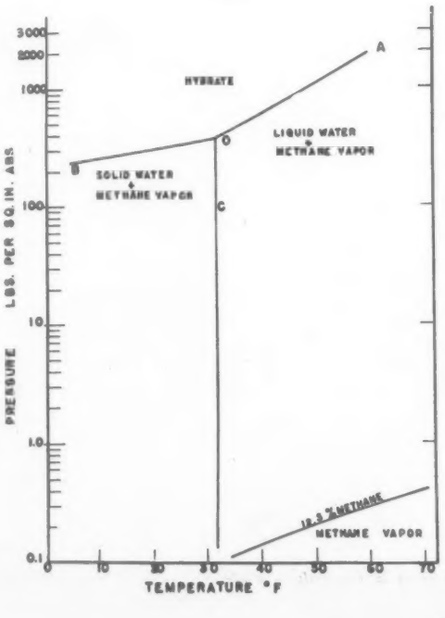
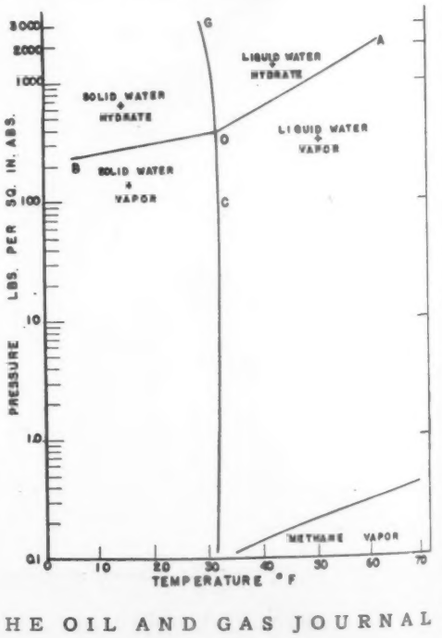


Fig. 5 (left)—Gas-hydrate-decomposition curves: Comparison methane and ethane hydrates. Fig. 6 (left, below)—Phase diagram—system methane-water: For composition of 12.5 mol per cent methane. Fig. 7 (below)—Phase diagram—system methane-water: For composition range from a value approaching 0 mol per cent to 12.5 per cent methane





as the temperature is varied in the region where all the vapor has formed hydrate. This same diagram describes all systems of less than 12½ mol per cent methane, unless the methane concentration is so low that the pressures as given by curve *OA* exceed those required to dissolve all the methane in the water. This would not happen until the concentration of methane was well below 1 per cent.

Fig. 8 shows the system when an excess of methane is present. Above the hydrate curve *BOA* there is hydrate plus vapor. As the methane content of the system increases the dew-point curve of water rises, and its position for a series of concentrations is shown in the diagram. These dew points are calculated from the partial pressure of the water vapor—no correction is made for the effect of the methane on the fugacity of the water vapor. The legend "methane vapor plus liquid water" applies to the region between any given dew-point curve and the curve *OA*. The slope of a dew-point curve increases slightly at its intersection with *OC*, since below this temperature the dew-point curve represents an equilibrium between ice and vapor instead of between liquid and vapor. The curve *OC* terminates at this intersection since at lower pressures there is no liquid present.

An example of a case in which the dew-point curve intersects the hydrate curve *OA* is given in Fig. 9. In this case there is a region in which hydrate forms directly from the vapor phase; the dotted curves, shown for purposes of comparison, are missing entirely. This situation may be brought about by dehydration. For example, a gas with a dew-point curve falling below point *O* would give hydrate difficulties to the left of curve *A'O*, which if this gas is dehydrated to give the dew-point curve shown as estimated for 99.98 per cent methane, hydrate could not form until the curve *A'B'* is reached.

Figs. 10, 11, and 12 show similar relations for the ethane-water system, the diagrams being complicated somewhat by the presence of a liquid-liquid region.

Tests have been made on mixtures of methane and ethane with water to determine the nature of the mixed hydrates from the variation in decomposition pressure with fraction of the gas converted to hydrate at constant temperature. It was found that hydrate formation starts when the total pressure is only slightly above the pressure at which pure ethane starts to form hydrates. Both gases completely disappear at a pressure considerably below that for the formation of methane hydrate. The results cannot be explained either on the basis of the two hydrates being present as separate phases, or as their being pres-

TABLE 1—SUMMARY OF METHANE HYDRATE DATA

Symbols:
V = Methane vapor saturated with water.
L_1 = Liquid water saturated with methane.
S_1 = Solid water (ice) saturated with methane.
S_2 = Solid methane hydrate.

Mol. % methane	Hydrate curve: Temp., °F.	Hydrate curve: P lb./sq. in. abs.	Phases in equilibrium
50.2	6.6	239	$S_1 + S_2 + V$
50.2	32.0	383	$S_2 + S_1 + V$
52.2	46.0	848	$S_2 + S_1 + V$
52.2	56.0	1,542	$S_2 + S_1 + V$
52.2	56.4	1,567	$S_2 + S_1 + V$

TABLE 2—SUMMARY OF ETHANE HYDRATE DATA

Symbols:
V = Ethane vapor saturated with water.
L_1 = Liquid water saturated with ethane.
S_1 = Solid water saturated with ethane.
L_2 = Liquid ethane saturated with water.
S_2 = Solid ethane hydrate.

Mol. % ethane	Hydrate curve: Temp., °F.	Hydrate curve: P lb./sq. in. abs.	Phases in equilibrium
1.77	42.7	152	$S_2 + L_2 + V$
1.77	56.9	443	$S_2 + L_2 + V$
1.77	58.3	495	$S_2 + L_2 + L_2$
1.77	58.9	539	$S_2 + L_2 + L_2$
2.83	59.1	717	$S_2 + L_2 + L_2$
2.83	59.1	737	$S_2 + L_2 + L_2$
2.83	59.3	632	$S_2 + L_2 + L_2$
2.83	58.1	712	$S_2 + L_2 + L_2$
2.83	58.3	622	$S_2 + L_2 + L_2$
4.72	39.9	127	$S_2 + L_2 + V$
4.72	46.3	191	$S_2 + L_2 + V$
4.72	49.3	238	$S_2 + L_2 + V$
4.72	52.3	310	$S_2 + L_2 + V$
4.72	52.5	298	$S_2 + L_2 + V$
4.72	54.7	368	$S_2 + L_2 + V$
5.87	9.8	42.7	$S_2 + S_1 + V$
5.87	10.0	42.1	$S_2 + S_1 + V$
5.87	25.0	64	$S_2 + S_1 + V$
23.35	32.5	79	$S_2 + L_2 + V$
23.35	36.1	97	$S_2 + L_2 + V$
23.35	43.7	164	$S_2 + L_2 + V$
35.5	59.4	992	$S_2 + L_2 + L_2$
35.5	58.8	992	$S_2 + L_2 + L_2$

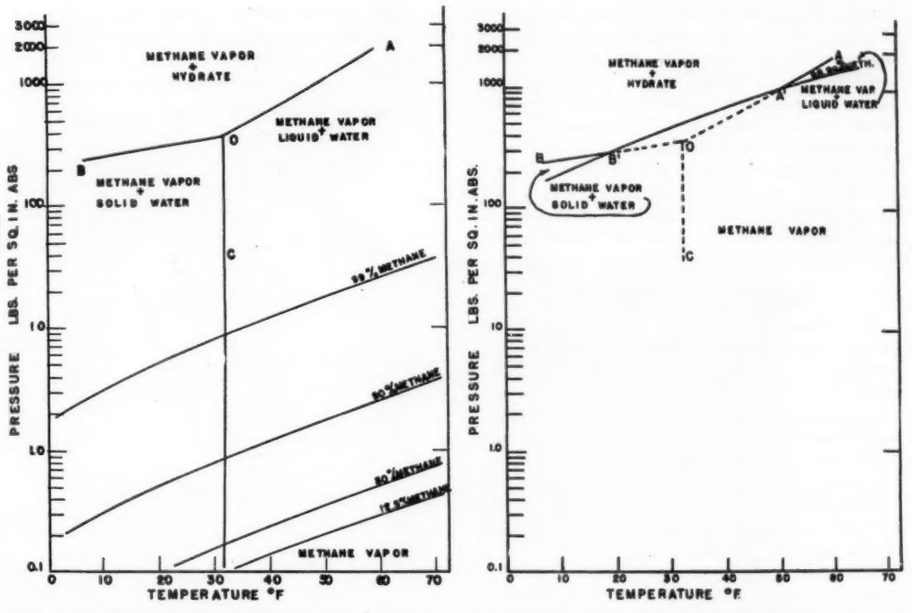


Fig. 8 (left)—Phase diagram—system methane-water: For composition range from 12.5 mol per cent to a value approaching 100 per cent methane. Fig. 9 (right)—Phase diagram—system methane-water: For composition range from 99.9 mol per cent to a value approaching 100 per cent methane

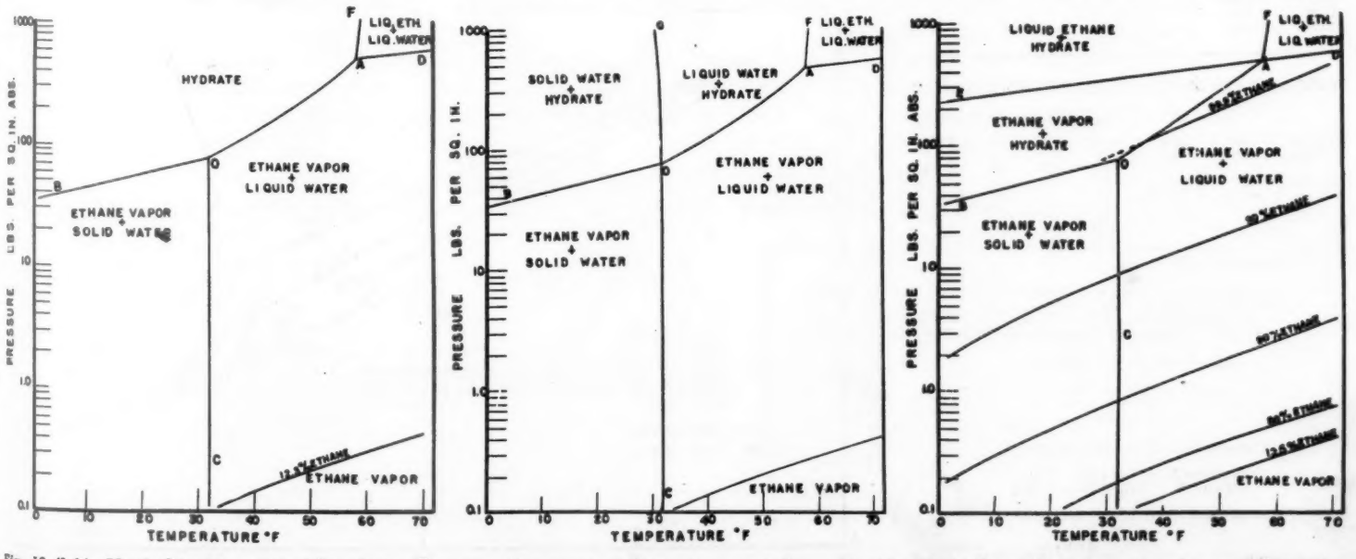


Fig. 10 (left)—Phase diagram—system ethane-water: For composition range of 12.5 mol per cent ethane. Fig. 11 (center)—Phase diagram—system ethane-water: For composition range from a value approaching 0 mol per cent to 12.5 per cent ethane. Fig. 12 (right)—Phase diagram—system ethane-water: For a composition range from 12.5 mol per cent to a value approaching 100 per cent ethane

ent as a homogeneous solid solution, each hydrate reducing the partial pressure required to form the other by an amount proportional to its concentration. Since both methane and ethane form hydrates containing 7 mols of water, it seems reasonable that the crystal structure is largely determined by the lattice structure of solid water, and that isomorphism would occur readily with consequent deviations from any simple relation between the composition of the gas and the formation pressure of the hydrate. Further work is in progress along these lines.

Calculation of Composition

The composition of a gas hydrate may be calculated from equilibrium curves as follows: First the heat of formation of hydrate per mol of combined gas is determined for its formation from liquid water plus gas, and for its formation from solid water (ice) plus gas. The difference between these two heats represents the heat of fusion of the water present in hydrate with 1 mol of gas. Dividing this heat by the heat of fusion of 1 mol of water gives the number of mols of water per mol of gas in the hydrate.

This method was used first by de Forcrand. He calculated the heat of formation of hydrate from gas plus liquid water as indicated below except that he assumed the gas followed the ideal gas laws.

De Forcrand further obtained the heat of formation of hydrate from ice and vapor by extrapolating his liquid equilibrium curve to 1 atm. pressure and postulating that the corresponding temperature multiplied by 30 equaled the heat of formation of hydrate from the vapor and solid states. His postulate was in effect a modification of Trouton's rule, but in so modifying the rule he exercised considerable empiricism. This assumption is in considerable error as indicated by the fact that de Forcrand estimated the heat of formation of methane hydrate from methane and ice to be 7,300 cal. per mol of methane, while a value of 4,390 cal. per mol is determined below from the equilibrium between ice and methane.

The calculation of the heat of hydrate formation for a hydrocarbon-water system with hydrocarbon gas, liquid water and solid hydrate present, rests upon the thermodynamic Equations 1, 2, and 3 of Fig. 13. Simultaneous solution of these three equations permits elimination of the chemical potentials dF/dM_1 and dF/dM_2, resulting in Equation 4.

The first term of the numerator of this equation, S^h, represents the entropy per unit weight hydrate. The second term represents the entropy of a unit weight of liquid multiplied by the weight of liquid used up per unit weight of hydrate formed; that is, the second term is entropy of the liquid that is used up when a unit weight of hydrate forms. Likewise, the third term is the entropy of the gas which went into a unit weight of hydrate. The difference between the first term and the two others then represents the net increase in entropy per unit weight of hydrate formed, of ΔS. This may be written $\Delta H/T$, where ΔH equals the heat of formation per unit weight of hydrate.

In a similar manner the denominator of Equation 4 may be seen to equal ΔV, the net increase in volume of the system per unit weight of hydrate. Rewriting Equation 4 in these terms we have Equation 5. If we let a unit weight of hydrate be that amount which contains a mol of hydrocarbon, the ΔH and ΔV of Equation 5 are the heat and volume increase per mol of hydrocarbon converted to hydrate. The derivation is thermodynamically rigorous to this point.

Let us assume that:

1. The mols of water dissolved in the gas which enter the reaction are equal to the mols of hydrocarbon dissolved in the water that enter the reaction.

2. The difference between the volume of water used and the volume of hydrate formed is negligible compared to the volume of the hydrocarbon gas used.

The combined error of these assumptions is probably less than 1 to 2 per cent. They will tend to make the calculated value of ΔH too high.

On the basis of these assumptions we may substitute the right-hand member of Equation 6 in Equation 5 and arrive at Equation 7. If $\log_{10} P$ is plotted against $1/T$ the slope of the curve at any point gives the value of $-\frac{\Delta H}{2.30\mu R}$. If the units of T are degrees Fahrenheit absolute, R may be

(Continued on Page 43)

TABLE 3—COMPRESSIBILITY OF ETHANE

25° C.		12° C.		0° C.	
P atm.	μ	P atm.	μ	P atm.	μ
5.08	.963	6.96	.940	6.00	.936
7.21	.950	9.86	.898	8.19	.905
7.55	.943	13.20	.866	11.48	.871
7.82	.943	18.21	.806	14.82	.819
11.48	.898	24.95	.720	18.15	.775
14.81	.865	29.73	.643	20.85	.738
18.22	.837	31.35	.610	22.15	.705
24.93	.766	31.85	.600	22.90	.688
31.75	.690	32.40	.467	23.60	.576
38.50	.574	....	....	....	....
41.90	.494	....	....	....	....
42.00	.470	....	....	....	....

TABLE 4—HEATS OF FORMATION OF GAS HYDRATES

	°F.	Lb./ sq. in.	μ *	ΔH, cal./mol.
Methane + ice → hydrate	32	383	.94	4,400
Methane + water → hydrate	32	383	.94	14,500
	50	1,080	.86	14,700
Ethane + ice → hydrate	32	74	.95	6,300
Ethane + water → hydrate	32	74	.95	16,300
	40	128	.908	16,200
	50	253	.812	17,300
	55	372	.72	19,000

* μ = compressibility factor.

$$CH_4\,(g) + XH_2O\,(s) \rightarrow CH_4 \cdot XH_2O + \Delta H_1$$
$$CH_4\,(g) + XH_2O\,(l) \rightarrow CH_4 \cdot XH_2O + \Delta H_2$$
$$XH_2O\,(l) \rightarrow XH_2O\,(s) + (\Delta H_2 - \Delta H_1)$$
$$\Delta H_2 - \Delta H_1 = X \cdot 1{,}430 \text{ cal.}$$
$$X = \frac{\Delta H_2 - \Delta H_1}{1{,}430}$$

Composition of hydrates at 32° F.

Methane X = 7.1; $CH_4 \cdot 7\,H_2O$
Ethane X = 7.0; $C_2H_6 \cdot 7\,H_2O$

Comparison with other investigators.

	Methane	Ethane
Present study	$CH_4 \cdot 7\,H_2O$	$C_2H_6 \cdot 7\,H_2O$
Hammerschmidt	$CH_4 \cdot 6\,H_2O$	$C_2H_6 \cdot 6\,H_2O$
De Forcrand	$CH_4 \cdot 6\,H_2O$	$C_2H_6 \cdot 7\,H_2O$

Fig. 13—Calculation of heats of formation

$$V^g dP = S^g dT + (1 - X^g)\frac{dF}{dM_1} + X^g \frac{dF}{dM_2} \quad (1)$$

$$V^l dP = S^l dT + (1 - X^l)\frac{dF}{dM_1} + X^l \frac{dF}{dM_2} \quad (2)$$

$$V^h dP = S^h dT + (1 - X^h)\frac{dF}{dM_1} + X^h \frac{dF}{dM_2} \quad (3)$$

Superscripts g, l, and h refer to gas, liquid, and hydrate phases, respectively.

V = volume of phase per gram
X = weight fraction of water in phase
T = absolute temperature
P = absolute pressure

$\frac{dF}{dM_1}, \frac{dF}{dM_2}$ = Chemical potential of hydrocarbon and of water in system.

$$\frac{dP}{dT} = \frac{S^h - S^l}{V^h - V^l} = \frac{\dfrac{X^h - X^g}{X^l - X^g} - S^g \dfrac{X^l - X^h}{X^l - X^g}}{\dfrac{X^h - X^g}{X^l - X^g} - V^g \dfrac{X^l - X^h}{X^l - X^g}} \quad (4)$$

$\frac{X^h - X^g}{X^l - X^g}$ = Weight of liquid reacting per unit weight of hydrate formed

$\frac{X^l - X^h}{X^l - X^g}$ = Weight of gas phase reacting per unit weight of hydrate formed

$$\frac{dP}{dT} = \frac{\Delta S}{\Delta V} = \frac{\Delta H}{T\Delta V} \quad (5)$$

ΔS = Net increase in entropy per unit weight of hydrate formed
ΔV = Net increase in volume per unit weight of hydrate formed
$\Delta H = T\Delta S$ = Heat of formation of unit weight of hydrate

$$\Delta V = \frac{\mu RT}{P} \quad (6)$$

μ = Compressibility factor for hydrocarbon
R = Gas constant

$$\frac{d \log_{10} P}{d\left(\frac{1}{T}\right)} = -\frac{\Delta H}{2.30\,\mu R} \quad (7)$$

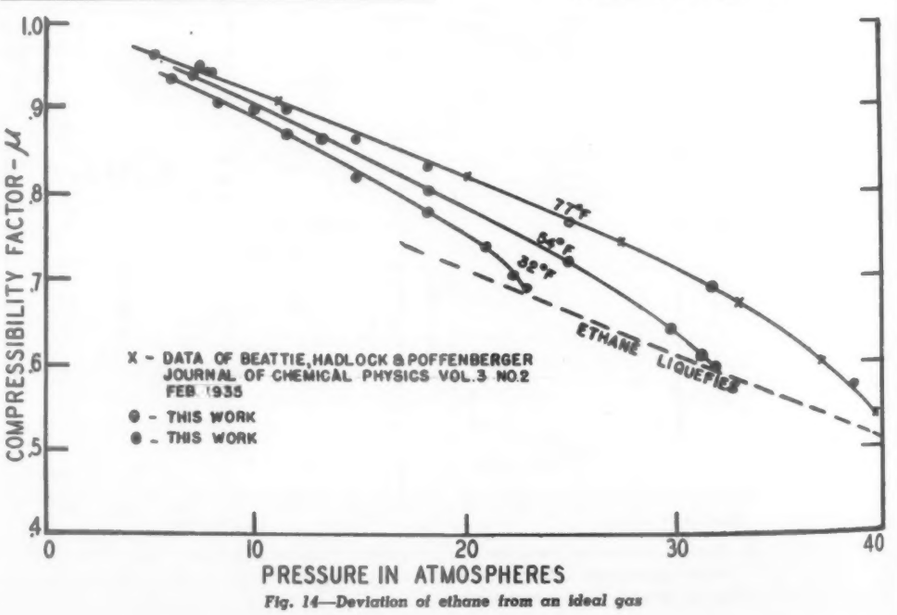
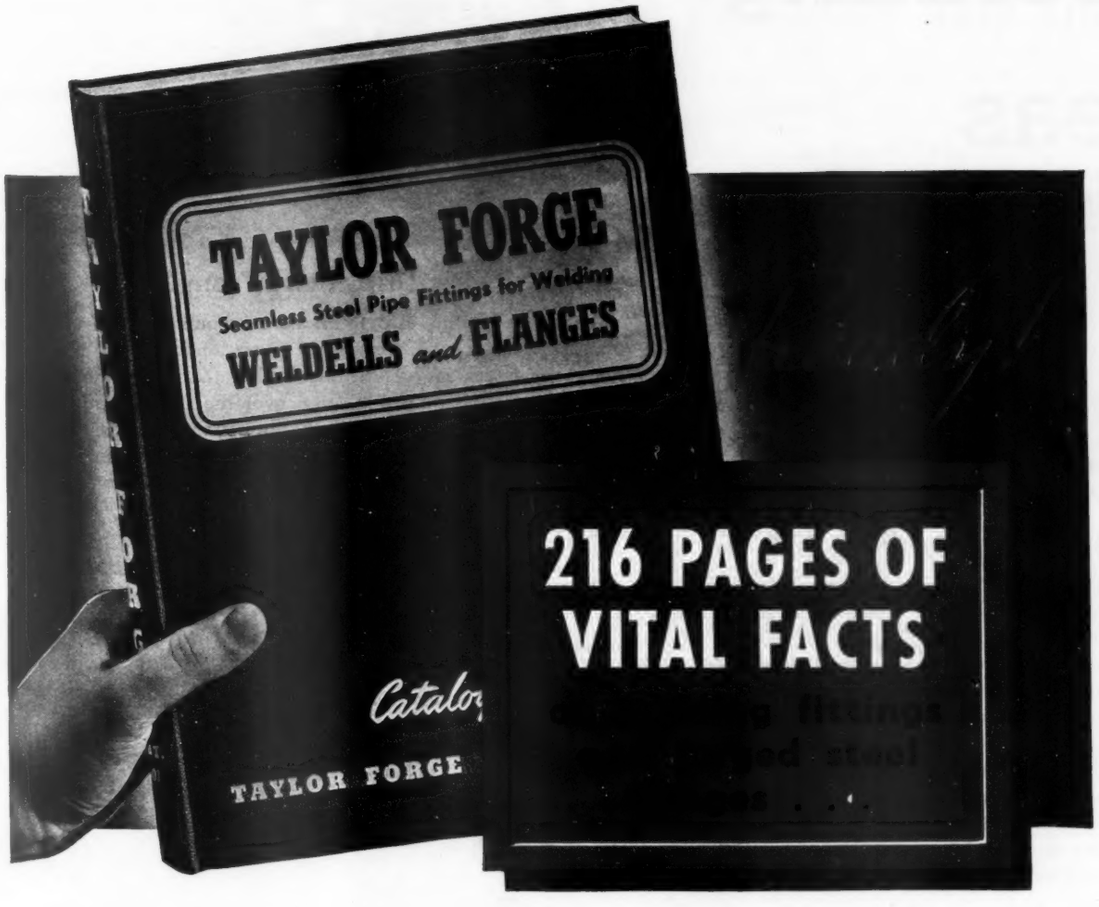


Fig. 14—Deviation of ethane from an ideal gas



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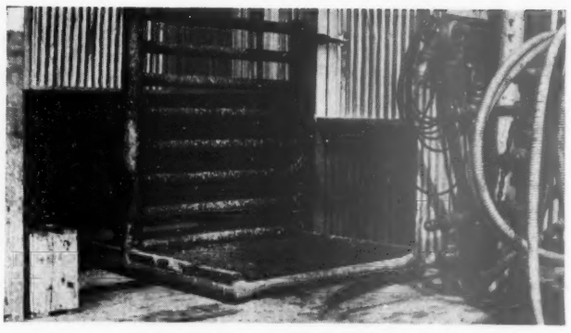
Operating Ideas



Welded Stand Prevents Foot Injuries

Building the usual steam-pipe heating grid in an L-shape instead of vertical, one company provides a section over which the men may stand, warming and drying their feet. To prevent actual contact with the steam-heated pipes, a welded grille is attached over the horizontal portion of the heater. This affords air circulation between pipes and grille, and assuring a firm footing and temperatures low enough to be noninjurious to shoe leather. The stand is welded permanently to the heater, stiffening and protecting it somewhat against transportation damage, and at the same time insuring delivery of the entire unit when the rig is moved to the next location.

Defective Material Marked

Many times drilling and core-drill crews discard a joint of drill pipe or a rod because it is defective, and then later pick it up and put it back in use. The mistake may be discovered before any damage results or it may go unnoticed with the result the pipe fails in the hole and a fishing job is in order. To prevent such mistakes, some core-drill crews enlarge any pin holes found in defective joints; the large hole is readily noticeable and the joint will never be picked up and run in the hole. Only a ball-peen hammer and a punch is needed for the task.

Keeping Oily Drip Away From Mud

Condensation and drip from the mud-pump exhaust, aimed directly out across the slush pit, was found to contaminate the mud and cause rapid changes in its characteristics. Rather than shift the exhaust line, it was extended by slipping 3-in. pipe over the 2-in. exhaust, and carrying this extension across the pit to discharge beyond the dike. The extension, easily placed or removed, fitted loosely enough on the exhaust stub so that no load was imposed on the pump through vibration or expansion changes.

Tie-Down Reduces Mud-Line Vibration

Mud lines often vibrate in spite of the use of air chambers and other means of damping. Pounding of the lines will result in fatigue breaks, particularly in the threads; by firmly anchoring the line, breaks may be avoided. A rig in the Cumberland, Oklahoma, field uses a deadman for holding the line firmly against a wooden support. The pull of the turnbuckle, as shown in the above picture, is toward the pump as it is from this direction the pulsations come.

Strut and Tie Rod Stiffen Engine Mounting

Using a heavy pipe strut, with its exact length adjustable through collars and long threads on the pipe, in conjunction with the usual tie rod and turnbuckle for uniting—for drilling purposes—derrick and drilling engine foundation, one company finds that greatly increased stiffness is obtained, and consequently lessened wear on chain and other equipment. The turnbuckles in the tie-rod units are used to align the foundation properly, pulling it against the strut ends as they are run out to give desired adjustment.

Constitution Diagrams of Methane And Ethane Hydrates

(Completed from Page 40)

taken as 1.10 cal. per mol, and ΔH will be in calories per mol (P may be taken in any units desired, for example, pounds per square inch or atmospheres, since $d \log P$ is dimensionless).

Since no data on the compressibility factor, μ, for ethane were available from the literature for the temperature and pressure range in which we are interested, these were determined in the gas hydrate apparatus. They are shown in Fig. 14 and Table 3.

The heats of formation of methane and of ethane hydrates from water and from ice at various temperatures are shown in Table 4. The difference between the heats of formation from water and from ice, at the freezing point of water, may be used to calculate the composition, as indicated above and as is shown in the table. Each hydrate contains 7 molecules of water. Considering the approximations used by earlier investigators, it is rather remarkable that their results agree as well as they do with the present work.

Summary

1. Phase diagrams have been determined for the methane-water and the ethane-water systems in the temperature range from 10° to 60° F. The equilibria studied included:

(*a*) Vapor-liquid-hydrate.
(*b*) Vapor-ice-hydrate.
(*c*) Liquid-liquid-hydrate.

2. Compressibility factors for ethane vapor have been determined in the pressure range from 5 to 35 atm. at 32° and 54° F.

3. Heats of formation of methane hydrate and of ethane hydrate from vapor and water and from vapor and ice have been calculated, from the foregoing equilibrium data correcting for the deviation of the gases from the ideal gas laws.

4. The composition of the hydrates has been found to be $CH_4 \cdot 7H_2O$ and $C_2H_6 \cdot 7H_2O$.

Acknowledgment

The authors are obligated to the Atlantic Refining Co. for permission to publish this work. Acknowledgment is hereby made to D. R. Conlon for his assistance in designing the equipment.

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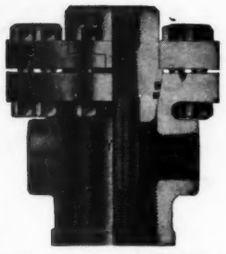

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Recent Advances in Illinois Drilling Practices

By BART DE LAAT
Division Engineer, Pure Oil Co.*

ELEVATION of the State of Illinois from seventh to fourth place in oil production during the past 2 years, with the present production at 10 per cent of the national total, gives some idea of the magnitude of intensified drilling which has been carried out during this period. The total number of wells drilled in the new fields has been nearly 8,000, about 6 per cent of which are nonproductive. It is probable that drilling will continue for at least an additional 3 years, though at lesser rates.

Since many of the conditions encountered in Illinois are distinctly different from those found in the fields to which most operators have become accustomed, and since this was an application of a rapid drilling program under new conditions, there have been a number of relatively recent developments which are of interest and of some value to the industry as a whole.

As is the case in many fields, the first exploratory wells were drilled with cable tools; however, the presence of numerous water-bearing formations caused a very early change to rotary drilling, and the only application of cable tools is in completion and reconditioning work. Accordingly, all the developments mentioned will concern rotary drilling.

The requirements for drilling equipment vary from field to field within the boundaries of the state. There is some difference in the general layout, or sometimes in the auxiliary equipment used by the various contractors and companies. However, the general trend is towards the lightweight type usually called "slim hole" equipment. One factor which has been of considerable importance in determining the equipment used is the extremely unfavorable condition of the terrain during the winter months. In some cases the cost of transportation has been the highest single item of expense in connection with the drilling of a well. Consequently, this has encouraged the use of lightweight equipment stripped down to bare necessities and has caused intensive effort on the part of companies and contractors to develop efficient means of transportation under such conditions, since drilling must continue throughout the year.

The transportation equipment used under such adverse conditions is usually heavy-duty tractors equipped with extra-wide tracks for increased bearing area, and all carry winch equipment. Machinery and material is hauled as close to locations as possible, then loaded on mud barges and the load is winched to the location.

Although the rotary method of drilling was selected as being the most advantageous, the nature of the formations throughout the region have worked unusual hardship on the equipment.

Drilling Time

The interval drilled by each bit rarely averages over 300 ft. This, of course, not only consumes a greater number of bits, but is a factor directly affecting the drilling time, as the hours per round trip increases with depth. One company has made an exhaustive analysis of the economic balance between drilling rate and expense of withdrawing drill pipe from the hole to change bits, and has adopted drilling-rate indices at various points in the hole which determine the economic limit of bit operation.

In addition, the abrasive nature of the formations causes severe erosive action on the drill pipe and particularly the tool joints. It has been necessary to replace tool joints as much as four times on a string of drill pipe, while ordinarily the life of the two is about the same and in many fields tool joints outwear the drill pipe. This problem has been partially solved by increasing the size of the tool joint to a maximum permissible diameter.

Partial hardfacing is used for protection on joints receiving greatest wear. Field application of tool joints has been developed to such a point that it is now possible to replace tool joints at the well without machine-shop equipment. This is accomplished by the use of a special shrink-type thread and the joint is applied hot and turned to a previously determined reference mark and permitted to air-cool which locks the joint in place. In addition, methods of replacement employing ribbons of steel or welded sleeves are being used to reduce the cost of repair.

In an effort to develop means of offsetting the effect of hard formations on drilling time, several companies have made intensive studies of drilling speeds in various formations. One simple means is by using rate-of-penetration studies which are based on data obtained with industrial speed-indicating devices and revolution counters. This equipment yields information concerning the number of revolutions of the bit needed to penetrate the various formations. From these data, the penetration index is obtained; which is the number of feet cut per 1,000 revolutions of the rotary table and is an absolute term.

The information obtained by rate-of-penetration indicators can be converted into absolute units by using a recorder, provided speed of rotation is kept constant. Use of the two instruments yields information of particular advantage in bit and time studies and is even applicable to geological correlation since relative drilling rates are found to check closely with formation changes as shown by electrical logging.

There is a general trend towards determination of the influences of various factors affecting drilling. While such studies are difficult to make, the presence of two major factors has been an ad-

*Paper was presented before the 1940 Illinois Mineral Industries Conference, Illinois Geological Survey, Urbana, Ill., November 16, 1940.

Two methods of driving a rotary table by an internal-combustion engine. The torque convertor at left absorbs the shock and makes it possible to have a high torque with a low rotating speed. The drive at the right is direct and the shocks from the rotary table are transmitted to the engine.

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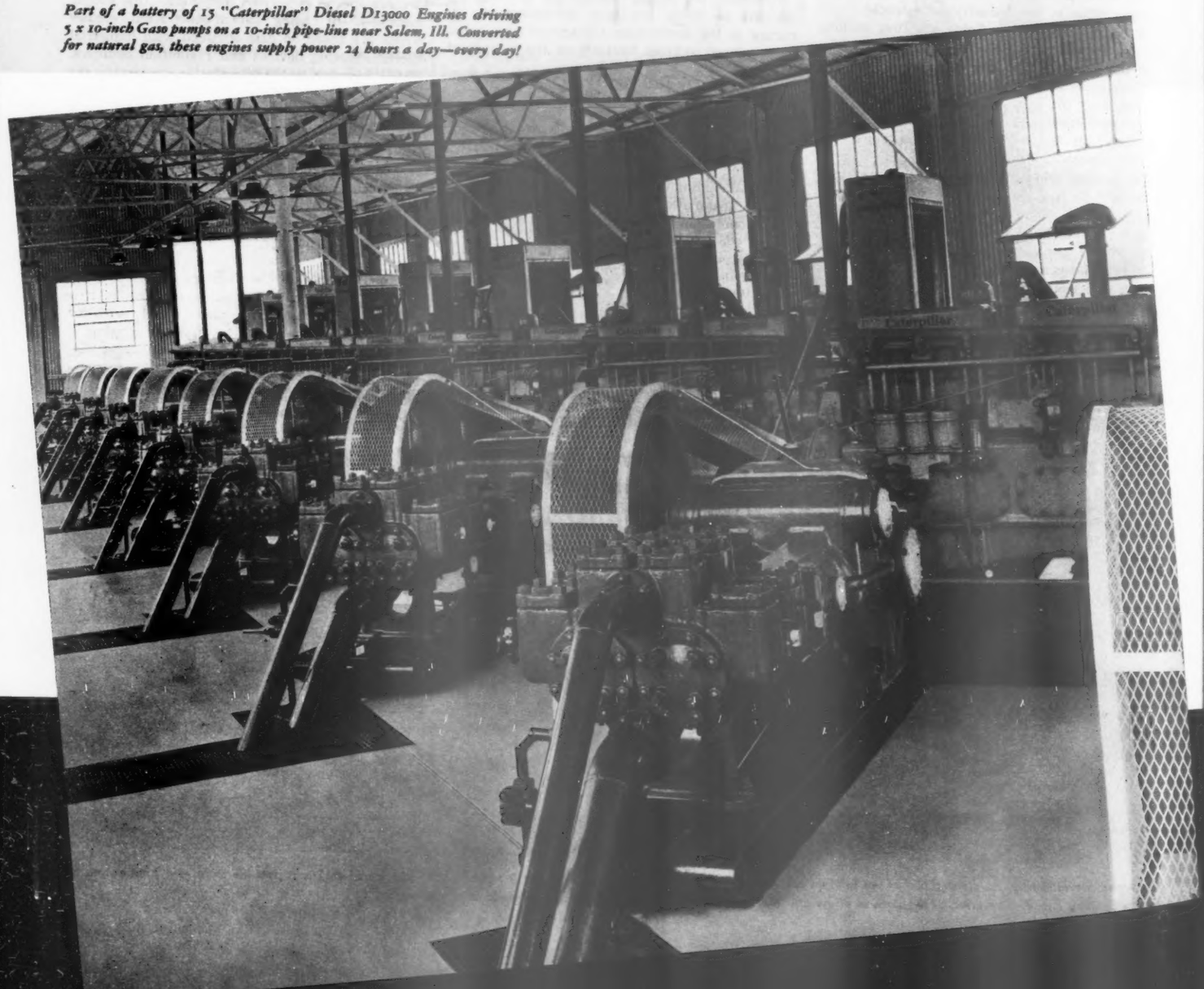


vantage. These factors are speed of rotation and weight applied to the bit. Rate of penetration studies in basin areas show that speeds of 200 to 225 r.p.m. achieve the optimum penetration index, without serious damage to equipment.

It has also been found that if the weight applied to the bit can be kept in the neighborhood of 3,000 lb. per sq. in. of bit, drilling rates are greatly increased. In some formations doubling the weight increases the drilling rate 400 per cent and experiments along this line are being carried out at the present time by the use of multiple or tandem drill collars. The size limitations due to hole diameter are such that it is difficult to obtain adequate strength in the joining members of these assemblies and full advantage of the high-weight principle will not be realized until this problem is solved.

Another problem peculiar to the Illinois field concerns the maintenance of drilling mud at maximum efficiency. In some areas the formations are so open that delicate hydrostatic balance must be maintained between the fluids in the well bore and the formation fluids. In addition, the presence of brackish water in certain fields has made it necessary to use special mud materials or to chemically treat the mud stream in order to obtain the satisfactory properties of gel strength, viscosity, filtrate, and cake formation.

Several companies at present are making circulation studies to determine the effect upon cement height behind casing. The usual practice is to mix mud preparatory to running casing, and it has been found an advantage to add gel to the slurry. This, together with casing rotation during the cementing operation, has obtained satisfactory cement columns with less material.

Owing to the relatively shallow depth of these fields, about 3,000 ft., it has been possible to use relatively light-weight rotaries. These rigs are principally mechanical using medium-speed multicylinder engines, usually skid-mounted to permit easy handling. A few truck-mounted units are in use.

Trend Toward Smaller Holes

The determination of the size of equipment to be used is dependent on many factors, and at present is largely influenced by the tendency towards smaller hole sizes. However, comparative tests show that there is a disadvantage in extremely small holes with respect to drilling costs, as external abrasion on the drill pipe, and bit consumption is increased. However, to drill a large hole involves the use of powerful equipment of heavy weight with corresponding increased cost. It appears that the best balanced hole for each field is being worked out by the particular operators in the field, which explains the differences in hole sizes found in the various parts of the state.

For example, in the central part of the basin one company has found a 7⅞-in. hole to be the best balanced size, all factors being taken into account. To drill this hole at the optimum drilling rate requires about 26 hp. at the bit and about 75 hp. applied to the drill pipe. To achieve the speed bracket desired, it is necessary to have prime movers of sufficient horsepower to operate at sustained speeds for long periods of time. It also follows that drilling at accelerated rates involves the use of a pump which will supply sufficient fluid to the bottom of the hole to flush away all cuttings and keep the teeth of the bit clean. It will be seen, therefore, that there are general relationships embodied in the selection of equipment which must be considered if the most suitable is to be found and applied.

A new development in the drive for mechanical rigs is the use of the torque converter unit which performs the functions of a hydraulic clutch and transmission. This permits almost infinite variation of speeds together with a fivefold increase in torque whenever needed for acceleration during the hoisting operation.

As to the future, predictions are always hazardous, but it may be of interest to point out some of the notable trends in equipment design and drilling methods.

It is probable that the general trend towards "slim-hole drilling" will continue; that is, towards reduction in hole size and casing size wherever practical limits are not exceeded. It is also expected that the tendency towards lightweight drilling equipment will continue and in particular the truck-mounted units with portable masts will come into more common practice for shallow drilling.

New methods of logging are now coming to the front, and it must be remembered that this is one of the most important elements in drilling; that is, precise knowledge of the formations being drilled. Fluoroscopic examination of the mud stream to augment logging is in use in other fields and may have application in Illinois, particularly for determining oil and gas shows. Electrical logging continues to be improved and it is possible that a means of logging electrically while drilling will be perfected so that continuous records of the formation as penetrated will be available, as experiments along these lines continue.

Since drill pipe is subjected to working loads which lead to its eventual deterioration and abandonment, while casing never receives working load but is installed purely as a construction unit, it is thought that it may be possible to employ "drill casing" which will drill and case the hole. Drill casing will use special coarse-thread couplings, but aside from this feature will be precisely the same as standard casing. It is probable that the shallow fields in Illinois will at least see experiments with this equipment.

Further improvements in materials are expected, particularly in the field of plastics, already in use to some extent.

The progress in drilling realized so far has been the result of effort on the part of equipment designers, manufacturers, contractors, and producing companies. It is this common effort which leads to the belief that progress will continue.

•

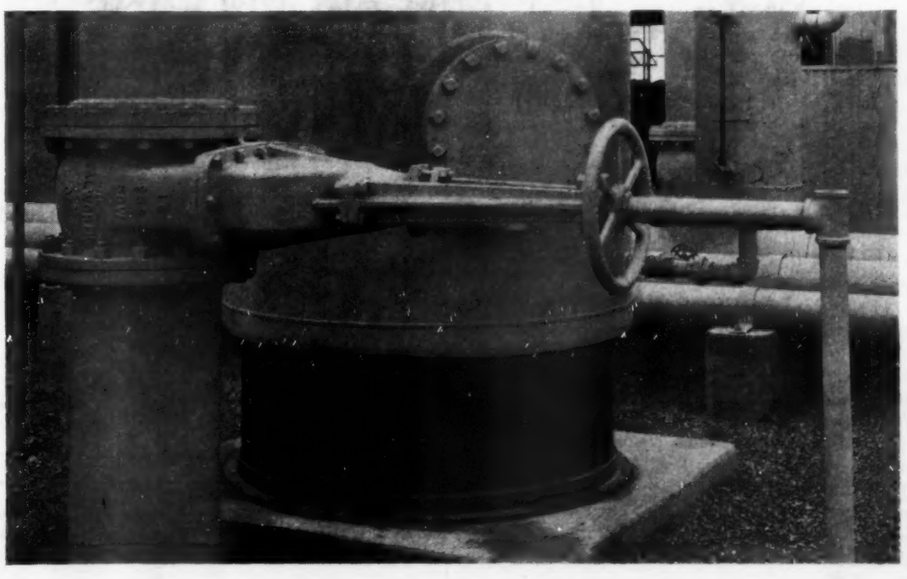
SAFETY - Guard on Stem of Horizontal Valve

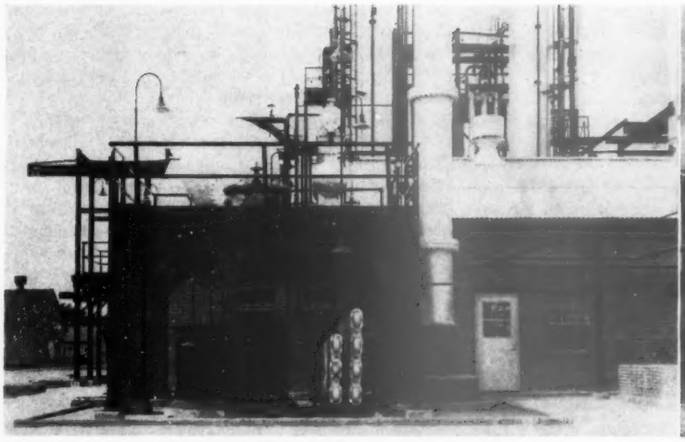
PREVENTION of falls and bruises due to walking into a projecting piece of equipment is a great aid in reducing the accident rate in the petroleum industry. Practically every piece of equipment has some danger point which needs guarding to prevent occurrence of an accident. Guards do not need to be elaborate as quite often a simple device will eliminate the source of danger; in many cases the installation of a guard will increase the ease of operation of the equipment and will also increase the efficiency of the personnel.

The accompanying photo shows a guard placed on a valve having a traveling stem. When the valve is open, the stem projects beyond the valve body and a workman passing by the vessel could very easily walk into it. The valve is at the right height to punch a man in the abdomen as he reaches for the valve wheel; such blows often result in internal injuries.

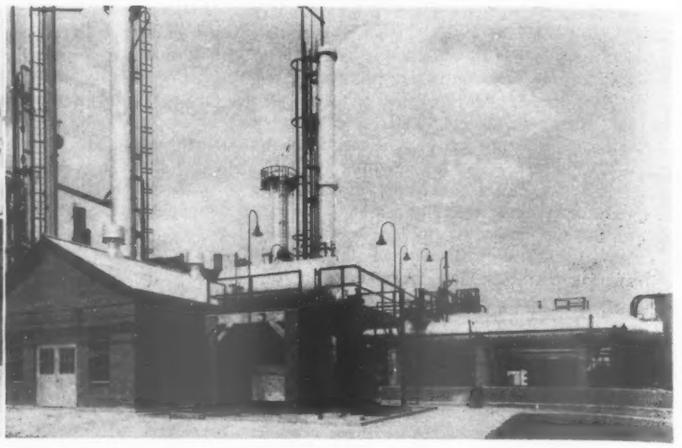
The guard is made from a couple of pieces of 2-in. pipe and a tee. One section of the pipe is set in concrete in the ground and the other slips over the valve stem and screws into the tee. The riser is located just far enough away from the valve to allow for the maximum travel of the stem. To prevent any projecting edge, the tee is placed running on the riser instead of bull-headed. The movement of the valve wheel is in no way impeded, in fact, by using an adapter the guard can be made to support the bonnet and stem assembly.

Use of such a guard establishes a permanent obstruction and prevents the workmen from making a pathway close to the valve stem. The guard is painted white and can be easily seen when approaching the valve, even when the scrubber and the ground around it is poorly illuminated. The stem on the valve has little luster and it is impossible to paint it as anything besides lubricant on the valve stem will impede its operation. At night, even with good illumination, the stem is hard to see and for this reason the use of a guard is particularly important.





Close-up of H_2S removal plant. On platform in front of pump house is the treating-solution regenerator with condenser and separator. Beneath are the solution mix tank and two banks of spine-tube heat exchangers. Absorber is at right



Plant for removing H_2S from liquid charge going to the catalytic polymerization plant at left. Absorber tower is in center. In front (left) of it are the boiler for regenerating phosphate solution, heat-exchanger bank, and regenerated-solution mix tank.

Choice of Charging Stocks to Make High-Octane Fuels

By HENRY N. LaCROIX
Design Engineer, Foster Wheeler Corp.

WITH the recent rapid changes in prevailing modes of both aviation and automotive transportation, the importance of high-octane-number gasoline has increased tremendously and this effect has been keenly felt in refineries throughout the world. A principal result is the trend toward "chemicalization" of the refining industry. The processes employed take the form of polymerization, alkylation, isomerization, solvent-refining and solvent-extraction plants.

Such processes are highly dependent on chemical affinities and reactions, and successful operation requires mastery of equilibrium distributions, laws of chemical mass action and physical chemistry. They are to be distinguished from the once-standard processes limited for the most part to simple heating, cooling and condensing, and involving ordinary distillation, cracking (by heating only) and combustion (simple burning).

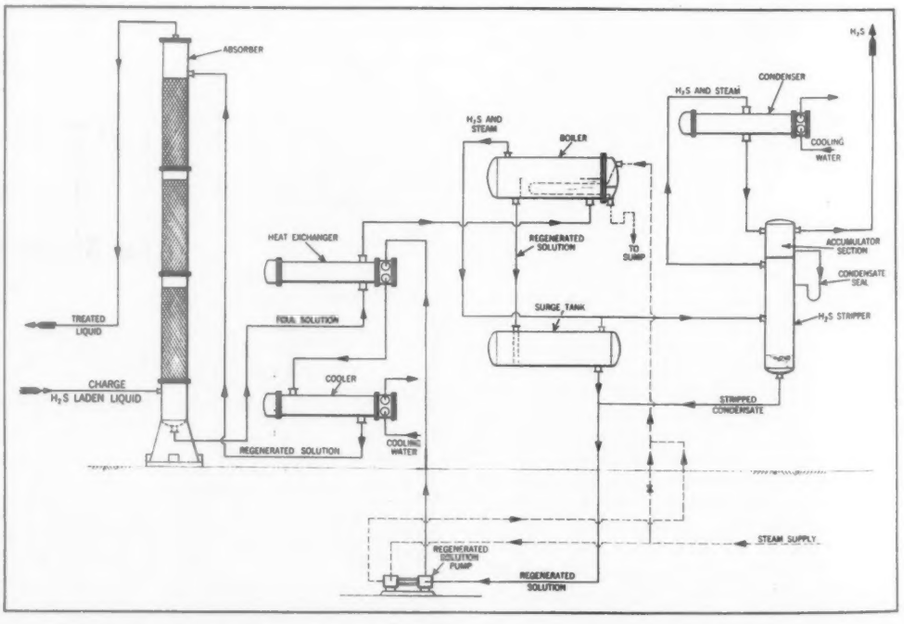
Although the modern processes were largely developed during the "thirties," there is every likelihood that the "forties" will see an even greater technological advance impelled not only by prevailing economic requirements but also by reckless pressure on the part of certain nations to extend their influence at any cost, with resulting bitter competition. Economic supremacy will demand adequate supplies of high-octane gasoline for aviation and automotive service to provide the better efficiencies of high-compression engines.

The preparation of high-octane gasolines is economically beyond the scope of simple pyrolytic cracking and requires the use of special processes such as polymerization or alkylation to fully utilize the available raw materials. Charge stocks for these units are usually light hydrocarbons, such as methane, ethane, propane and butane, and the unsaturated or "iso" relatives of these. These materials, however, are normally contaminated with organic impurities such as nitrogen or sulfur-bearing compounds. The impurities reduce the effectiveness or life of the catalysts employed in the new processes and frequently bring about side reactions, whose products are deleterious to the desired and final products. Many of the undesired impurities may be removed much more easily and effectively by treatment of the charge stock than by later treatment since the compounds in the charge are far less intricate.

One of the most obnoxious charge-stock impurities is hydrogen sulfide which reduces the net yield or effectiveness of the product, poisons the catalyst, and forms undesirable sulfur compounds which are difficult to remove later. Fortunately, the H_2S is easily removed from the charge stock by a number of methods, of which one of the most economical is the phosphate process. One of the latest plants of this type to go into operation is illustrated in the accompanying photographs.

This is a liquid-extraction unit preparing liquid hydrocarbons for charging to a Universal Oil

(Continued on Page 54)



Flow diagram of typical unit for removal of H_2S from liquids based on single, countercurrent flow of treating solution and hydrocarbon tower, filled with Raschig rings, to give satisfactory mixing and contact surface. The treating solution is regenerated and H_2S vented from the system

Constancy of Application Is Important Factor in Cathodic Protection

By NEIL WILLIAMS

RESULTS of work done by Houston Pipe Line Co. over a period of several years in the application of cathodic protection for its lines have led engineers of this company to the conclusion that one of the most important factors in the success or failure of protecting pipe from corrosion lies in the constancy with which the protective potential is maintained.

It has always been assumed and has been established in this work, and in repeated tests and research, that with the cessation of the electrical charge producing cathodic protection, the protective potential built up gradually dissipates as the "hot spots" are always discharge areas which tend to return to their natural electro-positive condition.

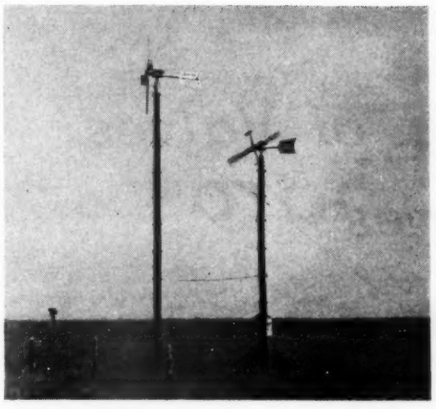
Research on the part of this company also has indicated that all corrosion of iron ceases when the negative potential built up is below —0.2853. When this potential is dissipated and rises above that point, adequate protection is not given the line and the benefits to be derived from the cathodic protection applied are somewhat nullified.

To insure maintenance of a negative charge on a line below the critical point at which corrosion of iron ceases has been an operating phase of cathodic protection that has been given particular consideration by this company. At those places where purchased power is utilized this is not a difficult problem, but at many locations wind-driven generators are provided. Dependent entirely upon wind conditions, there are periods in which the latter do not run, leaving a line without protection unless other provision can be made for continuing electrical charge to the line.

Minimum Charge Used

Due to dissipation of the protective potential being more or less gradual upon cessation of the charge, it is possible that with large-enough equipment, sufficient excess protective potential might be provided during periods of windcharger operation to carry the line over, in some cases, until charging could be resumed. However, for the most economical functioning of cathodic protection, this company considers it desirable to hold the line charge at a minimum that will provide protection under normal conditions, which would be close to the critical point of a negative potential of —0.2853 volts. On this basis it always has tried to maintain a minimum negative charge of —0.3 volts when measured from the pipe to the soil immediately adjacent to it. This leaves comparatively little margin for dissipation of potential.

In view of this, practices of the company have been directed to use of small power windchargers with provision for more constant application of protection over longer periods of time rather than



Double installation of wind-powered generators used by Houston Pipe Line Co. in cathodic protection work

installing the large types of windchargers that have been put in by some of the other companies. To insure maintenance of protection during periods the windchargers are down due to wind failure, the company has found the use of storage batteries feasible.

Consequently, all installations of this company call for the use of two windchargers, one charging direct to the line and the other to batteries supplying the protection to the line when the windchargers are not running. In most installations the charger connected direct to the line is of 32-volt size and the one charging the batteries is of 12-volt size. The investment involved in the two small windchargers ordinarily is no greater than the cost of a single large-size charger of types sometimes used.

A 225-amp.-hr. storage cell commonly is provided, connected to the line through a system of relays. When the windchargers cease to function due to wind failure, the storage battery charge is automatically cut into the line. Although the discharge rate of the battery is only about one-fourth of the average current supplied by the larger direct windcharger, it has been found adequate to hold the negative potential of the line over almost any period the windchargers ordinarily might be down. When the windchargers start running, the battery discharge is cut off automatically, allowing the small charger to recharge the cells.

Operating Time of Windchargers

Corrosion engineers of the Houston Pipe Line Co. have made extensive studies of operating time of windchargers as this affects the potentials on the line to be protected. Some of the results of these studies and tests are shown in Fig. 1. They were analyzed by David Harrell, corrosion engineer of the company, in an article in the April 1940 issue of Electrical News, monthly publication of the Petroleum Industry Electrical Association. He stated:

"In the upper 12-hour period indicated in the

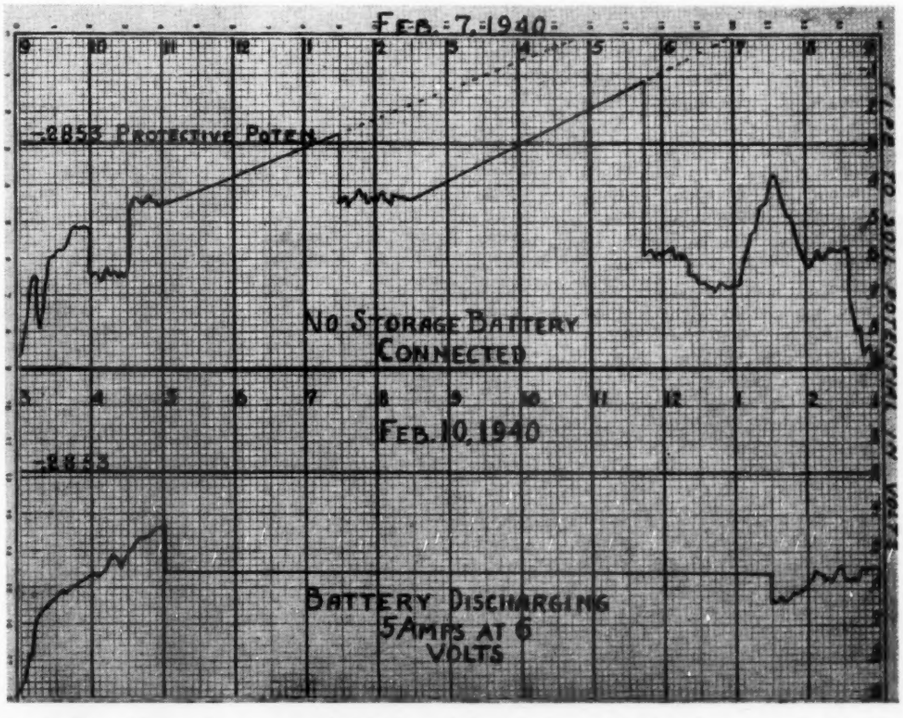


Fig. 1—Chart showing effect of operating time of wind chargers on potentials of the line to be protected. (From Electrical News, monthly publication of the Petroleum Industry Electrical Association)

chart it will be noted that the storage battery at the windcharger was deliberately disconnected. When the wind died at exactly 11 a.m. on February 7 it will be seen that the charge on the line rose at a very definite rate from a negative condition of —0.45 volts to a negative charge of only —0.26 by 1.30 p.m. We have extended the curve with a dotted line to show where it would have gone had not the wind generator tripped the relay and resumed operation at 1:30 p.m.

"We see that the windcharger ran from 1:30 p.m. to 2:25 p.m. when it again stopped and the negative pipe potential started its decline as formerly. This time, however, the charger did not resume operation again until 5.45 p.m., by which time the potential had risen to —0.11. We see some very interesting facts exposed by these curves. In the first place we note that dx/dt, or the time rate of change of the negative potential, which is equal to the slope of the curves, is a function of the time rate of charge to the line. In other words, when the charge ceased at 11 a.m. the mill had been charging for 16 hours continuously at a high rate. It took the negative charge 6 hours and 45 minutes to reach a zero, whereas in the second case zero was reached in only 4½ hours. This is evident by observing that the slope of the first negative decline curve is not nearly so steep as the second one.

"On February 10 at 5 a.m. we have a similar condition. The windcharger had been in operation for a long period of time; then it suddenly quit. This time, however, we had the 225-amp.hr. storage cell connected on the line through a system of relays. We will note that our battery, while its discharge rate is only about a fourth of the average current supplied by the big windcharger, held the negative potential at —0.56 for a period of 8½ hours without showing any decline whatever."

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Motor Operation of Valves For Oil Refineries

By C. W. KUHN
Supervising Engineer, Cutler-Hammer, Inc.

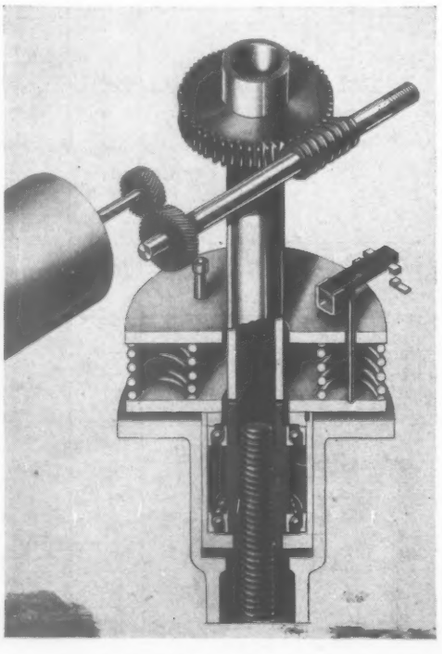
IN recent years motor valves have found a wide field of application in oil refining. Some of the modern processes used require the frequent reversal of oil or vapor flow. In many installations this must be done at hitherto unobtainably high speed. In addition, unusually high temperatures are often involved. These are in the order of 1,000° F. and higher. Such temperatures change the dimensional characteristics of the valve, particularly the stem, and might cause "jamming." This could occur even though the materials used in the valve parts have the same coefficient of expansion. In routine operation, and when the valve is opened the stem is exposed to atmospheric temperature. When the valve is subsequently tightly closed against hot oil, the stem elongates. This tends to seat the valve more tightly.

In some high-temperature high-pressure plant operation it has therefore been common practice to "back off" the valves periodically when shutting down to avoid serious jamming. In general the preferred motor operation of valves is such that the valve will be tightly closed but not jammed.

The thrust-seating type of valve unit is particularly adapted to "tight seating" and the relief of stresses due to temperature changes. This type of unit is equipped with heavy springs which exert a pressure directly on the yoke nut for limiting the pressure applied to the valve stem. Consequently, the changes of dimension of the valve stem, when the valve is closed, simply compress the thrust springs rather than jamming the valve.

Using this type of seating, the valve can be closed leaktight under all operating conditions. This is accomplished by use of a thrust switch for deenergizing the motor, after the heavy thrust springs have been compressed a limited amount and after a definite thrust has been applied to the valve seat. These thrust springs are further capable of absorbing the kinetic energy in the motor, which energy could result in jamming the valve.

The design of a typical thrust-seating type of valve unit provides that the yoke nut be positively driven by a worm-and-gear reduction between the yoke nut and the driving motor. The yoke nut is mounted with heavy thust springs between it and the frame of the valve unit. When the valve reaches its seat, and the thrust of the yoke nut is mounted with heavy thrust springs set thrust value, the yoke nut climbs the stem, compressing the thrust springs, which operates the thrust switch. Operation of the thrust switch deenergizes the motor. The kinetic energy (nearly all of which is in the motor) is then absorbed by the further climb of the yoke nut against the thrust springs. The efficiency of the yoke nut is subject to appreciable variation depending upon lubrication. Further, it is directly dependent upon stem diameter and lead.



Cut-away motor-operated refinery valve equipped with sleeve and cushion springs to avoid "jamming".

This type of valve unit might also provide for the protection of the valve against any obstruction coming between the valve disk and the seat.

Thus, the modern thrust-seating unit provides means for absorbing the kinetic energy in the motor and, without the use of declutching mechanism, prevents jamming. This is of particular importance for high-speed operation. The thrust springs being located between the unit and the yoke nut, they are not required to absorb as much of the kinetic energy as was necessary for the "torque seating" type of valve unit. A major part of the kinetic energy in the motor is dissipated in the thrust-seating type before it reaches the thrust springs. If the efficiency of the worm drive in the unit is 60 per cent and that of the yoke nut 50 per cent, the thrust springs will be required to absorb only 30 per cent of the kinetic energy in the motor. In an average-size unit, the kinetic energy in the motor will be approximately 1,600 ft.-lb. On the basis of the above the thrust springs would then need to absorb only 480 ft.-lb. of kinetic energy.

If the springs were located in the main drive, more than twice as much active spring material would be necessary for like results.

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Choice of Charging Stocks to Make High-Octane Fuels

(Continued from Page 50)

Products catalytic polymerization plant. It employs the patented Shell phosphate process, using aqueous solutions of tripotassium phosphate, which is applicable to removal of H_2S from both liquids and gases. In either system the hydrocarbon is contacted countercurrently with the phosphate solution in towers, and the absorbing solution is continuously regenerated and recirculated through the process.

The photographs clearly show the absorber tower, the simple regenerative equipment, and the mixing tank for preparing the phosphate solution, as well as the spine-tube heat exchangers which provide unusually high heat transfer rates. The phosphate salt may be prepared by chemical neutralization of the acid and alkali components, or it may be purchased in crystalline form, ready to be dissolved in water.

This plant was designed to operate on charge stock containing only 150 grains of H_2S per 100 standard cu. ft. of gas, with provision for handling greater quantities if encountered. Due to the small quantity of H_2S to be removed no condensate stripper was needed. Operation to date has shown a reduction of H_2S content to as low as 7 grains. The troublesome hydrogen sulfide is recovered in a gaseous state and is easily disposed of by burning in the boiler furnaces. Operation of the process is simple and costs for both initial installation and operation are relatively low.

A number of H_2S removal plants using the phosphate process are operating on charge stocks for producing various high-octane blending fuels as for example, polymerization units charging both gases and liquids, and alkylation units. The same purification process is also being used on natural gases and by a manufacturer of isopropyl alcohol. The phosphate process is attracting increasing attention of refiners as a simple and economical means of disposal of H_2S and is especially valuable in the preparation of high-octane blending fuels.

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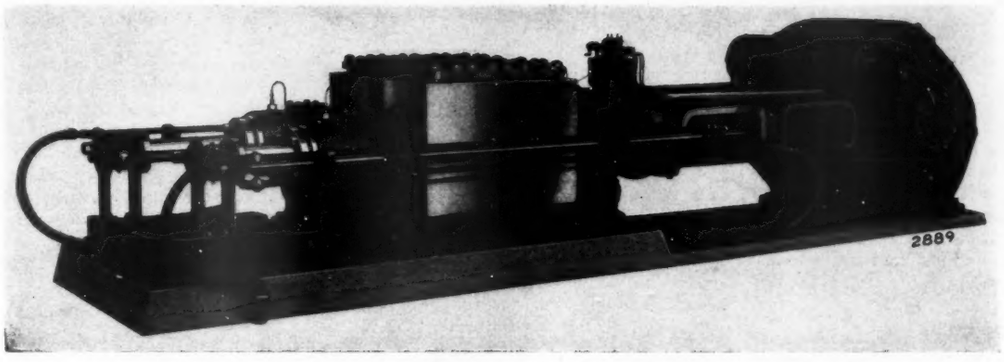

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QUESTIONS ON TECHNOLOGY

By W. L. NELSON, TECHNICAL EDITOR

Determination of Lead In Motor Fuels

Please advise the laboratory test for determining the amount of lead in motor fuels that have been treated with lead compounds. The volumetric test is the one I have in mind.—C. E. B.

A relatively new test is the volumetric test developed by the Imperial Oil Co. and Ethyl Gasoline Corp.—and adopted as a tentative standard of the American Society for Testing Materials as D526-39T which may be found in "Petroleum Products and Lubricants" which is published yearly by the A.S.T.M. from 210 South Broad Street, Philadelphia, Pa. Standard equipment may be purchased from the Yonkers Laboratory Supply Co., 509 West 132d Street, New York. The method is also described on Pages 324-25 in the June issue of Industrial Engineering Chemistry. Details of the test are as follows:

Apparatus

The apparatus which is made of pyrex glass is essentially a 500-cc. boiling flask, equipped with a Hopkins reflux condenser, a thistle tube, a heating tube wound with a 220-watt heating coil, and a stopcock for draining. (For details see A.S.T.M. or Yonkers Lab. Supply.)

REAGENTS AND SOLUTIONS

Hydrochloric acid	C.P. analyzed (d. 1.19)
Nitric acid, conc.	C.P. analyzed (d. 1.42)
Nitric acid, diluted	C.P. analyzed (d. 1.42), diluted 1:20
Ammonium hydroxide	C.P. analyzed (d. 0.9)
Acetic acid	1:1 solution of glacial acetic acid
Tannic acid	U.S.P. fluffy, 0.1 g. in 20 ml. of water
p-Nitrophenol	0.5 per cent solution in water
Ammonium molybdate	$(NH_4)\ Mo_7O_{24} \cdot 4H_2O$. C.P. analyzed
Lead nitrate	C.P. analyzed
Potassium dichromate	Filtered 10 per cent solution
Heavy distillate (sold by Std. Oil of Ind. and others)	A straightrun petroleum distillate, low in acid number and approx. 10 per cent distilled at 400° F. and 90 per cent at 460° F.

Procedure—A

Pipette into the flask a 100-ml. sample of the gasoline to be tested. (Notes 1 and 2.) Add 50 ml. of hydrochloric acid and reflux the gasoline and acid for 30 minutes. The sample is heated with the full heat of the heater until boiling has begun (usually 0.5 to 1 minute) after which by regulating with a rheostat the current is dropped to approximately 80 volts for the remainder of the time. Drain the acid into a 500-ml. Erlenmeyer flask. Now add 50 ml. of distilled water and reflux the water and gasoline for 5 minutes, using the full heat of the heater. Drain the water into the flask containing the acid, and repeat the water extraction a second time. Evaporate the acid and water solution to dryness. To the dry lead chloride add 3 ml. of concentrated nitric acid and heat to oxidize any organic material that may be present. If one treatment of nitric acid is not sufficient to completely oxidize the organic material, repeat the oxidation until a white salt is obtained. Dissolve the dry lead salt in dilute nitric acid and transfer to a 400-ml. beaker. Neutralize the solution with ammonium hydroxide and complete the determination gravimetrically as described for the standardization of the lead nitrate, or volumetrically as described for the standardization of the ammonium molybdate.

Procedure—B

This is the same as Procedure A, except that a 50-cc. sample of the gasoline is used, with the addition of approximately 50 cc. of heavy distillate.

Note 1.—The pipette used for the sampling of the gasoline should be calibrated for gasoline delivery and the time specified.

Note 2.—The temperature of the gasoline should be taken at the time it is sampled for analysis. A correction of 0.1 per cent is added to the final results for each degree above 15° C., or subtracted for each degree below 15° C. to obtain the true lead content at 15° C.

Standard Solutions

Lead nitrate.—Dissolve 4.8 g. in 1,000 ml. of water containing 2 ml. of nitrate acid. To an aliquot of 50 ml. add 6 drops of the *p*-nitrophenol indicator and neutralize the solution first with ammonium hydroxide adding 5 ml. excess, and then with acetic acid, adding 1-2 ml. excess. Dilute to 200 ml. Bring the solution to a boil, and add dropwise 15 ml. of the potassium dichromate solution. Boil the solution until the precipitate is colored to a deep orange. Cool. Allow the precipitate to settle for several hours, filter through a tared Gooch crucible, wash thoroughly with hot water, dry the precipitate at 110°-120° C., and weigh as lead chromate.

$$\frac{\text{Wgt. } PbCrO_4 \times 0.64109}{50} = \text{g. Pb./ml. of solution}$$

Ammonium molybdate.—Dissolve 2.38 g. in 1,000 ml. of water containing 2 ml. of ammonium hydroxide. For standardization, take an aliquot of the standard lead nitrate solution, preferably 25 ml., add *p*-nitrophenol indicator, neutralize with ammonium hydroxide to slight excess and then make acid with acetic acid using 1-2 ml. excess. Dilute to 150 ml. Bring the solution to a boil and titrate hot with the ammonium molybdate solution, using tannic acid as an external indicator. For the endpoint tests, four drops of the solution are added to two drops of the tannic acid solution contained in the depression of a spot plate. Always use the same quantity of tannic acid solution and test solution for the spot tests. Determine a blank for the same amount of solution and subtract it from the volume of molybdate solution used (about 0.3 ml.).

$$\frac{\text{ml. } Pb(NO_3)_2 \times \text{equiv. gm. Pb/ml.}}{\text{ml. molybdate soln.}} = \text{equiv. gm. Pb./ml. molybdate solution}$$

If the molybdate solution is adjusted to 2.7934 mg. of lead per ml., then for a 100-ml. sample of gasoline, and using 1.65 as the density for lead tetraethyl:

ml. molybdate solution $\times$ 0.1 = ml. $Pb(C_2H_5)_4$/gal.

For the best results the lead solution should be kept at 90°-100° C. during the titration. An electric hot plate is convenient for this purpose, and is so regulated that it will keep the sample at gentle boiling during the entire titration.

Lead acetate.—A volume of the standard lead nitrate solution is taken, which when neutralized with ammonium hydroxide and acetic acid, and diluted to a definite volume will correspond to the molybdate solution milliliter for milliliter. This solution is used for the back titration of the molybdate solution, if the sample is over titrated, or, for adding known quantities of lead to the titrating solution, particularly for samples that are below an equivalent of 0.5 ml. of tetraethyl lead per gal.

Comments

1. It is suggested that both Procedures A and B should be tested and compared. Procedure A was found to be satisfactory on all but the most volatile gasolines, while Procedure B is equally satisfactory on all gasolines.

2. Consistency of results alone cannot be taken as a safe criterion of their accuracy, and therefore the fuels used for the tests should be carefully blended, by weight if possible, and using weighed amounts of analyzed ethyl fluid.

Gas Versus Fuel Oil For Power Engines

Will you please inform me which would be cheaper to operate, a diesel engine burning fuel oil at 7 cents per gallon or a natural-gas engine using gas at 25 cents per 1,000 cu. ft.? The engines would be used in drilling wells and would be of approximately the same horsepower.—W. N. T.

Among the elements which would govern the cost of operating the engines, would be (1) the cost of the fuel, (2) differences in the engine efficiencies, and (3) certain less definite but highly practical considerations of convenience, skills of your operators, future prices of fuels, etc.

In your situation, the difference in the cost of the two fuels is so great that no other arguments are significant. The approximate cost of 1,000,000 B.t.u. of heat (or power) will be as follows for the two fuels:

$$\text{Gas: } \frac{25 \times 1{,}000{,}000}{1{,}000 \times 1{,}000} = 25 \text{ cents per 1,000,000 B.t.u.}$$

$$\text{Fuel oil: } \frac{7 \times 1{,}000{,}000}{7 \times 20{,}000} = 50 \text{ cents per 1,000,000 B.t.u.}$$

In these computations the heating value of gas was taken as 1,000 B.t.u. per cu. ft. and for fuel oil, 20,000 B.t.u. per lb. There are about 7 lb. in a gallon of fuel oil.

Thus, the cost of the fuel oil is about twice as great as that of the gas. None of the other advantages could overcome this great difference.

IT'S SERVICE CAPACITY—FIRST, LAST AND ALL THE TIME

Changing practice in refinery operation has resulted in putting a progressively greater burden on accessory equipment of many kinds. So it has become increasingly important to operating economy to specify materials on the basis of service capacity first, last and all the time.

Pipe is no exception. For example, comparatively high temperatures coupled with corrosive materials make special demands. And it has been demonstrated that Chromium-Molybdenum (4–6% Cr.) steel measures up to the service and economic requirements.

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Complete data on Chromium-Molybdenum and other heat-resisting Molybdenum steels for refinery use will be found in Section 8 of our technical book, "Molybdenum in Steel". Either the complete book or the individual section will be sent free on request to interested engineers.

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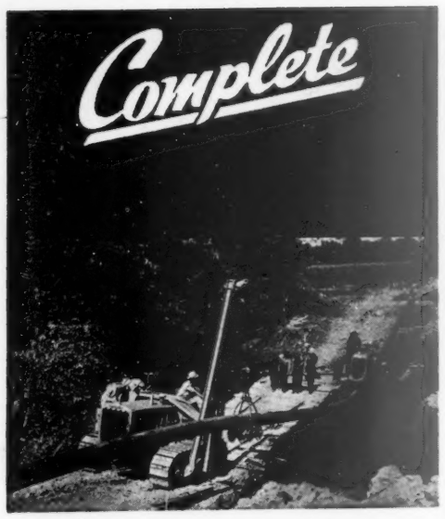

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Pipe-Line Activity

Latex Construction Co. Lays Lines on Four Projects

HOUSTON, Tex.—Pan American Pipe Line Co. of Houston has let contract to Latex Construction Co. for 22 miles of 10-in., 8-in., and 6-in. gathering line in the Kilgore and Longview areas of East Texas. Contracts for additional gathering line remain to be let. The gathering lines will serve Pan American's new trunk line now being laid from East Texas to the Gulf Coast.

Southern Minerals Co. of Corpus Christi, Tex., let contract to Latex for laying 16 miles of 6-in. and 4-in. pipe lines as extensions to its gathering system in the Corpus Christi district.

With less than 20 miles of pipe remaining to be laid, Texas-New Mexico Pipe Line Co. expects to have its new pipe line from the Slaughter area of Hockley County, West Texas, to Midland completed within the next 2 weeks. The line will be approximately 105 miles long, connecting at Midland with the company's trunk line to tidewater. It is being laid with 14-in., 10-in., and 8-in. pipe. Work is being done under contract by Latex.

Houston Pipe Line Co., Houston, let contract to the Latex Construction Co. for the construction of 3½ miles of gas line from the company's booster station at Edna to the Texana area in Jackson County, Tex. Three miles of the line will be 12-in. and ½ mile of 4-in.

New Tankage Will Be Provided For Moving Venezuelan Oil

PHILADELPHIA, Pa.—New tankage will be provided at Twin Oaks, Pa., near Philadelphia, and at Cygnet, Ohio, near Findlay, for the purpose of providing adequate facilities at junction points on pipe lines which have been made available for the transportation of Venezuelan crude oil across the northern part of the United States. This is the only construction work required for handling this movement of oil for Standard Oil Co. of New Jersey interests, from Marcus Hook, Pa., on the Atlantic seaboard to Imperial Oil Co. of Canada's refinery at Sarnia, Ont. Shipments start this month.

Kaw Pipe Line Co. Will Lay Extension to Bemis

Kaw Pipe Line Co. will spend approximately $400,000 in a pipe-line expansion program in western Kansas this winter. The first of the series of projects will be extension of the 8-in. trunk-line system now terminating at Sullivan station in the Gorham pool, Russell County, Kansas. The new extension will reach 23 miles northward to the Bemis pool of northern Ellis County. Kaw Pipe Line Co. issued specifications to contractors on Monday for the construction of the line; bids will be received at the end of the week and the contract will be awarded soon afterward.

The new projects give the Bemis pool its second pipe-line outlet, the sole line serving that field at present being the Stanolind Pipe Line Co. Bemis, one of the five largest fields in the state, comprises 338 wells with a combined potential of 851,429 bbl. daily, and a net November monthly allowable of 257,852 bbl. It is reported, but not confirmed, that the system will later be extended to the Burnett pool of northern Ellis County which contains 128 oil wells with a combined potential of 359,335 bbl. daily, and a monthly allowable of 165,831 bbl.

Kaw Pipe Line Co., owner of one of the largest pipeline networks serving the western Kansas district, is owned jointly by the Phillips Petroleum Co., White Eagle division of Socony-Vacuum Oil Co., Inc., Texas Co., Cities Service Oil Co., and the Skelly Oil Co. Management is directed by an operating committee comprised of representatives of each of the member companies. J. K. McGoldrick, Tulsa, is general manager of the Kaw organization.

Panhandle Eastern Expands Kansas City Headquarters

Panhandle Eastern Pipe Line Co. is taking more space this month for the headquarters office at Kansas City, Mo., by occupying three floors of the Midland Building. By this move the company increases office space 50 per cent.

Texas Commission Lets Pipe Lines Use Bridges

AUSTIN, Tex.—In an announcement of policy, effective until further notice, the Highway Commission has announced it will grant pipe-line companies permission to attach lines to highway bridges when conditions at a particular waterway justify. It expressed opposition to the practice in the interest of safety but recognized that in some cases special conditions altered the situation. In the future, permission will be given subject to these conditions: That attached line in no way obstruct water or traffic flow; that companies indemnify the Highway Department against any damage to the bridge structure or the traveling public.

W. R. Davis Co. Obtains Right-of-Way in Texas

McALLEN, Tex.—Cameron and Hidalgo counties have granted rights-of-way for construction of a pipe line from the Rincon field in Starr County to tidewater at Brownsville. The W. R. Davis Co., to whom the land rights were granted, is laying a 15-mile line to loading racks at Rio Grande City. Mr. Davis had

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Pipe-Line Personalities . . . . David W. Harris

DAVID W. HARRIS

DAVID WILLIAM HARRIS, vice president and general manager of Arkansas Natural Gas Corp., Shreveport, La., has been in the utility business since his graduation from the Georgia School of Technology, with a degree of bachelor of science in electrical engineering, in 1912.

His first connection, immediately after graduation, was with the Denver Gas & Electric Co., Denver, Colo. Soon afterward, he was advanced to the New York office of Henry L. Doherty & Co. as director of the budget and assistant treasurer of Cities Service Co.

In 1927, Mr. Harris went to Shreveport to direct the merging of a number of oil and gas companies in the formation and organization of the Arkansas Natural Gas Corp. Several months later, early in 1928, he was selected to guide the new corporation and its affiliates and was made vice president and general manager. The operating companies are now the Arkansas Louisiana Gas Co., Arkansas Fuel Oil Co. and the Arkansas Pipe Line Corp.

Before coming to Shreveport in 1927, Mr. Harris was treasurer of the Empire Gas & Fuel Co. and vice president of the Illuminating Oil Co. of Bartlesville, Okla.

Mr. Harris is a member of the board of councillors of the American Petroleum Institute, a member of the Southern Gas Association, and in October of 1940 was reelected for a 2-year term as director of the American Gas Association. He is also president of the Orange State Oil Co., Miami, Fla., and a director of the Shreveport Chamber of Commerce. Mr. Harris has two sons, Walter A. Harris, who was graduated this year from the Arizona State University, and Holton E. Harris, a student at Georgia Tech, which was established through the efforts of Mr. Harris' father, former Gov. Nathaniel E. Harris of Georgia.

announced a $2,000,000 refinery at Brownsville and a $500,000 recycling plant in the field prior to selling a half interest in the field to Continental Oil Co.

United Gas Connects With Continental Gas Production

HOUSTON, Tex.—Latex Construction Co. has just completed laying 12½ miles of 8-in. gas pipe line for the United Gas Pipe Line Co. from Abbeville, Vermilion Parish, Louisiana Gulf Coast, to a point near Milton, La., where the line will tie into the latter company's main system. The line will provide outlet for gas production of Continental Oil Co.

Major Systems Consider Relaying Lines Near Wilmington, Ill.

Pipe-line executives and contractors are looking over the ground in the vicinity of Wilmington, Ill., this week in preparation for construction work which is being considered in connection with the relaying of sections of three major pipe-line systems near the site of a plant which is being built for the manufacture of TNT for the U. S. Government as part of the armament program. A section of Stanolind Pipe Line Co.'s lines is affected which consists of 8 to 10 miles of right-of-way along which there are one 8-in. and two 12-in. lines. Sinclair Refining Co., pipe line department, is considering taking up 7 miles of 14-in. and 14 miles of 8-in. and laying of 10 miles of 8-in., 10 miles of 10-in. and 10 miles of 14-in. Some consideration is being given to the possibility of relaying a short section of the Texas-Empire Pipe Line Co. system.

Leonard Pipe Line Lets Contract to Gentry

MOUNT PLEASANT, Mich.—Construction of a pipe line from the new Winterfield area, Clare County, Michigan, to the company's Temple station will be started immediately by the Leonard Pipe Line Co. Plans call for a 6-in. main line with lateral outlets for a complete field gathering system. At Temple the company has both pipe line and rail tanker outlets to important Michigan refining centers. Contract for construction was let to H. L. Gentry Engineering Co.

Standard Pipe Line Plans Outlet for Eola Field, La.

BATON ROUGE, La.—Standard Pipe Line Co. will lay 32 miles of 8-in. pipe line from the Eola field, Rapides Parish, Louisiana Gulf Coast, to a connection with its main South Louisiana trunk system to Port Allen, across the Mississippi River from Baton Rouge. The line will provide the first direct pipe-line oulet for that field.

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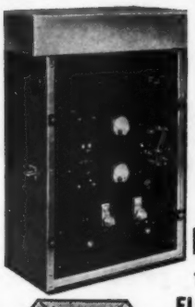

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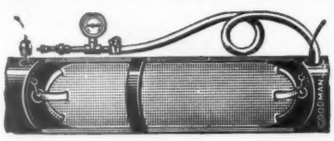

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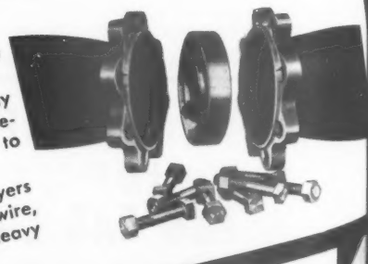

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

For the second successive week, completions ran nearly 20 per cent below the average level maintained during the past few months. This was in part due to bad weather conditions as floods affected many areas, both in the Mid-Continent and along the Gulf Coast. The drop in field completions, however, is proportionately greater than the decline in wildcat completions, indicating a normal end-of-year diminution of activity.

Owing to a decline of 423,500 bbl. production in Texas, and small end-of-month curtailment elsewhere, average daily production stood at the lowest level of the year and 443,228 bbl. below last week's level. During the corresponding week of 1939, production dropped 518,234 bbl. so that last week's production remains slightly above last year's level.

Significant developments during the past week included what may prove the final quietus to the Clinton sand play in eastern Ohio. Although no important discoveries were recorded in new areas, major extensions were either proved or are indicated for many fields, particularly along the Frio-Vicksburg trend in Southwest Texas. Two important finds were made in West Texas and the Slaughter-Duggan and Halley-O'Brien areas may become increasingly active owing to showings in outpost wells. Discovery of oil in the Eocene in the Wheeler Ridge area of California may stimulate deeper drilling in that area.

NORTH TEXAS: Prospects were again seen for the opening of a new field between the Hapgood field in Clay County and the Ringgold field in Montague County. The recently discovered Vogtsberger field in Archer County is receiving an intense exploratory play as outposts are drilling on two sides.

WEST CENTRAL TEXAS: New deep wildcat locations in Eastland, McCulloch and Throckmorton counties, together with field extension activity in Jones and Haskell counties, led the week's work in the West Central Texas district.

EASTERN TEXAS: High flood waters the early part of the week inundated many of the district fields and considerably decreased the weekly field activity, especially in the East Texas field where large areas in the main part of the field were under several feet of water.

SOUTHEAST NEW MEXICO: Eddy County's recently opened Dayton field, which already has a mile south outpost drilling, was given a new 3-mile north outpost as work progresses to determine the true scope of this new field.

OHIO: Two more dry holes in eastern Ohio's deep Clinton sand play added to those previously drilled lessen the chances of success for the activity which started during the spring of this year.

EASTERN KENTUCKY: An abnormally large number of gas wells were reported during the week, although production is small in most of them.

FOREST CITY BASIN: Activity has been slowed down throughout the Forest City basin; in Falls City because of inadequate outlets for production and in the remainder of the area by bad weather and a lack of encouraging results.

ILLINOIS: New pools were discovered in Jefferson and Hamilton counties. Activity continues to decline, except in White County which is responsible for nearly one-third of the oil wells completed in the state. Centralia became active again with five completions, including a 3,750-bbl. well in the Devonian.

OKLAHOMA: Inspired by the West Hewitt development, wildcatting is on the increase in southern Oklahoma and a hot play is developing, particularly in Stephens County, where the majors are taking out additional acreage.

WEST TEXAS: A good showing of oil was found in a test about 3 miles southwest of the Duggan field, of which the discovery may prove to be an extension. A shallow pay was discovered between the Lehn and Apco fields in Pecos County and production was also obtained from a new sand about 400 ft. below the regular pay in the Shearer field. The area between the Halley pool in Winkler County and the O'Brien area in northern Ward is being developed steadily, and the possibilities of the South Magnolia-Sealy area in Ward County were greatly increased by a gas well which is running considerably higher than the discovery well.

SOUTHWEST TEXAS: Extensions are recorded in several fields along the Frio-Vicksburg trend. These include the North Rincon, Yzaguirre and Boye fields in Starr County. Distillate production in East Fremont was extended about a mile south and a number of outposts to other fields are approaching critical stages.

LA-ARK-TEX: Indications of a new deep Cotton Valley formation were encountered. Shallow wildcats in Clark County, Arkansas, are showing oil at around 600 ft., and gas was discovered in the Paluxy sand in Shelby County, Texas.

TEXAS GULF COAST: Locations for important wildcats are announced for the Cypress and Chenango prospects in Harris and Brazoria counties, as much of the drilling activity is slowed down because of floods.

LOUISIANA GULF COAST: A wildcat on the West Bay prospect, Plaquemines Parish, is reported running high. In the Iowa field, a new sand, probably Vicksburg, flowed gas. The new pay is 500 ft. below the Iowa deep pay which is undergoing development at this time.

COLORADO: There is a revival of interest in the Piceance Creek structure in Rio Blanco County, western Colorado. This structure has a large gas reserve and it is reported that considerable work has been done in developing a market.

CALIFORNIA: Eocene production has been discovered in the foothills belt near Wheeler Ridge, opening up possibilities for deeper production in that field. Other development in California has quieted down as operators seek some method of curtailing present overproduction.

KANSAS: With only three new wildcats announced, activity in Kansas hit a low for the year. Two of the tests are in Stafford County while the third is in Barton County.

MONTANA: A well swabbing 368 bbl. is a record well for the southeastern part of the Cut Bank field.

COMPLETIONS IN ALL FIELDS . . .

(Week Ended November 30, 1940)

	Oil	Gas	Dry	Total	1940 total comp. to date	1939 total comp. to date
N. Y., Pa., and W. Va.	68	23	5	96	5,471	3,333
Ohio	2	12	13	27	1,116	807
Indiana	6	1	4	11	454	320
Kentucky	3	12	10	25	477	660
Illinois	45	0	24	69	3,519	3,381
Michigan	3	1	4	8	1,074	1,350
Kansas	11	3	5	19	1,643	1,243
Oklahoma	15	2	9	26	1,663	1,604
Texas:						
North Central Texas	37	1	12	50	2,653	2,246
West Texas	41	0	1	42	1,674	1,691
Texas Panhandle	6	0	1	7	529	408
Eastern Texas	6	0	1	7	579	657
Texas Gulf Coast	9	0	2	11	1,135	1,243
Southwest Texas	20	5	7	32	1,925	2,244
Total Texas	119	6	24	149	8,495	8,470
North Louisiana	5	1	1	7	603	494
Louisiana Gulf Coast	14	1	5	20	943	683
Total Louisiana	19	2	6	27	1,546	1,177
Arkansas	3	0	1	4	170	231
Montana	5	0	1	6	219	160
Wyoming	2	0	1	3	153	126
Colorado	0	1	0	1	17	20
New Mexico	9	0	0	9	497	540
California	16	1	4	21	941	852
Miscellaneous	2	1	4	7	223	58
Total United States	328	65	115	508	28,779	24,604
Total previous week	335	55	116	506		
Week ended Dec. 2, 1939	394	53	133	580		

New Field Between Lehn and Apco; Deep Pay in Shearer

By
R. MARNE SANFORD

MIDLAND, Tex., Dec. 2.—The week's activities in West Texas were filled with major development for almost all counties in the district. Pecos County was given a new shallow discovery area and also a new and deeper horizon for an old field.

New areas recently opened in Winkler and Ward counties reported major developmental steps which are expected to bring considerable drilling in the immediately following months.

The new Pecos County field was R. G. (Tex) Patillo 1 P. E. O'Neil estate, 2 miles southeast of the Lehn field and 2½ miles west of the deep Apco field. Started originally as a deep Ordovician test several weeks ago, a show of oil in shallow sands from 1,607-60 ft. was found about 10 days ago. It was decided that the well would be completed from the shallow level and not carried ahead to the Ordovician. The pay was shot with 140 qt. and is cleaning out and flowing at the rate of about 46 bbl. daily. Before shot the well flowed about 30 bbl. daily. The total depth is 1,675 ft. and the discovery is located 660 ft. from the S cor. Section 74, Block 10, H.&G.N. Sur..

Opening a deeper level for the Shearer field in Pecos County, Davis & White 1-A Fromme, Section 110, Block 10, H.&G.N. Survey, approximately ½ mile east of the field, was last reported pumping at the rate of about 5 bbl. hourly or 120 bbl. daily. The regular Shearer field pay level was missed and in deepening pay was found from 1,865-75 ft., some 400 ft. below the regular Shearer pay. Official completion has not been recorded for the well.

SUMMARY OF COMPLETIONS

NORTHERN WEST TEXAS

Fields—	No.	Prod.	Footage
Oil wells	22	*14,565	109,407

SOUTHERN WEST TEXAS

Fields—	No.	Prod.	Footage
Oil wells	19	*21,486	65,668
Dry hole	1	.....	4,194
Total completions	20	.....	69,862

SOUTHEAST NEW MEXICO

Fields—	No.	Prod.	Footage
Oil wells	8	*600	20,407
Wildcats—			
Oil wells	1	*15	4,385
Total completions	9	..	24,792
Recompletions	2	*92	.....

PANHANDLE

Fields—	No.	Prod.	Footage
Oil wells	6	*1,790	18,152
Wildcats—			
Dry hole	1	.....	3,249
Total completions	7	.....	21,401

*Barrels.

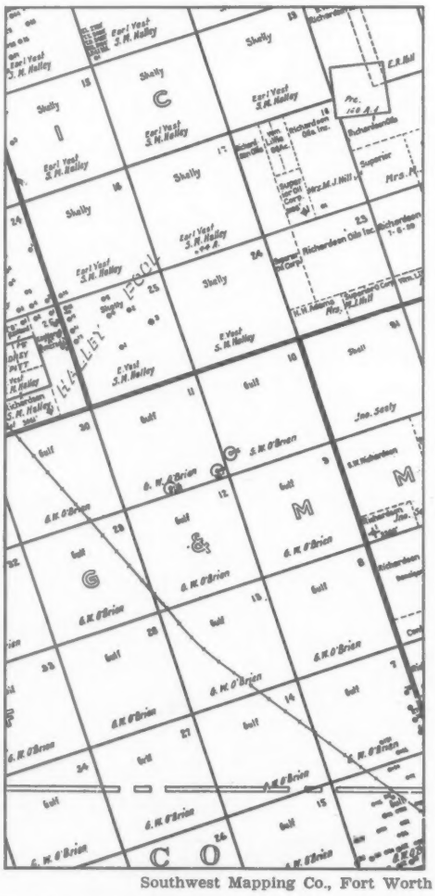
Winkler County

Indicating steady development for the area recently opened in southern Winkler County and between the Halley and the O'Brien areas, Gulf Oil Corp. has completed its second well and has staked location for a third. The field was discovered several months ago by the Gulf 136 O'Brien, SE SW Section 11, Block F, G.M.M.B.A. Survey, about 1½ miles south of the Halley, when it was completed for a small pumper from the 2,874-ft. level. A ½-mile east outpost to the discovery was immediately started and was this week completed for a good flowing well. It was Gulf 147 O'Brien, SE SE Section 11, same block and survey. The well flowed 259 bbl. of oil daily through casing from pay bottomed at 2,874 ft. for new activity in the area Gulf has staked 155 O'Brien, a northeast offset to the new completion and located just east of the center of the west line of SW Section 10, Block F, G.M.M.B.A. Survey. About 2½ miles south of the new area is the O'Brien production which is somewhat scattered but consistently from the same pay level. It is believed that, although the new area is a discovery spot, it will at some future date link the Halley and the O'Brien areas into one long field.

Ward County Area Active

A new gas well has been brought in and a new location has been made for the South Magnolia-Sealy field in Ward County. The area was opened about 2 months ago by Atlantic 1 Wickett-University, located in SW NE Section 12, Block 16, University Survey. The discovery made 1,540 bbl. of water and 452 bbl. of oil daily from a total depth of 2,920 ft. Closely following this completion Magnolia staked 141 Sealy, SE SW Section 41, Block F, G.M.M.B.A. Survey, a 1-mile north outpost. This well was recently completed for 646 bbl. flowing in 20 hours from a total depth of 2,901 ft., considerably higher structurally than the discovery well. Indicating even a larger structure than was first believed, a new well has been brought in the past week for a large gas producer. It is about ½ mile further north of 1-41 Sealy and found its pay some 20 ft. higher than 1-41 Sealy. The pay was found about 39 ft. higher than the original discovery which made a large flow of salt water with its oil. Indications are that the new gas well, Magnolia 2-41 Sealy, NE SW Section 41, same block and survey, is on the top of the structure and that the structure will yield oil production for the entire radius of 1½ miles around the gas well as it has done 1½ miles to the south. The new gas well blew wild for several days the past week but was finally brought into control by mudding the pay section.

The new location for the area was Atlantic 3 Wickett-University, 990 ft. from the north and 2,310 ft. from the west lines of Section 12, Block 16, University Survey. It is between the discovery well and the Magnolia 1-41 Sealy, the second producer in the area. No. 2 Wickett-University, just northeast of the discovery well, was a failure.



Southwest Mapping Co., Fort Worth

The discovery area 1½ miles south of the Halley field in southern Winkler County has been given a ½-mile east extension and a new northeast offset location. It was opened several weeks ago by the official gaging of Gulf 136 O'Brien

SOUTHERN WEST TEXAS COMPLETIONS

Crane County

Waddell field: Gulf 24 Henderson, 5,311 bbl., tubing and casing, 5,000 gal. acid, 3,548-50 ft.
Gulf 34 Waddell, 72 bbl., tubing, 10,000 gal. acid, 3,540-48 ft.
McElroy field: Gulf 231 McElroy, 857 bbl., casing, 730-qt. shot, 2,711-2,962 ft.
Jordan field: Shell 7-B University, abandoned location.

Ector County

Harper field: Broderick & Calvert 4 Bagley, 966 bbl., tubing, 350-qt. shot, 4,130-4,325 ft.
Goldsmith field: Gulf 320 Goldsmith, 473 bbl., tubing, 4,000-gal. acid, 4,156-4,243 ft.
Gulf 321 Goldsmith, 495 bbl., tubing, 1,000 gal. acid, 4,110-74 ft.
North Cowden field: Rhodes, Tompkins & Great Western Prod. 2 Maurice, 448 bbl., tubing, 695-qt. shot, 4,008-4,245 ft.
Richmond Drlg. and Collins 1 Smith, 1,986 bbl., tubing, 700-qt. shot, 4,060-4,195 ft.
Sunray 2-J Johnson, 1,256 bbl., ¾-in. choke, 311-qt. shot, 4,055-4,182 ft.
Tide Water 3-A T.&P., 703 bbl., tubing, 285-qt. shot, 4,040-4,190 ft.
Trinity Drlg. 1 T.&P., dry at 4,194 ft.
Jordan field: Texas Co. 5 McDonald, 1,617 bbl., tubing, 1,000-qt. shot, 3,385-3,700 ft.

Upton County

McCamey field: Starnes & Yates 1 Owens, 60 bbl. oil and 60 bbl. water, pumping, 80-qt. shot, 2,800-22 ft.
Shell 46 Bowen, 151 bbl., pumping, 3,000 gal. acid, 2,277-2,340 ft.
McElroy field: Gulf 229 McElroy, 3,504 bbl., casing, 3 per cent water, 510-qt. shot, 2,708-2,845 ft.
Texas Pacific 2 Eddleman, 499 bbl., tubing, 700-qt. shot, 2,958-3,208 ft.

Ward County

Estes field: Acme Oil & Royalty 3 Shell-Sloan, 135 bbl., pumping, natural, 2,455-3,024 ft.
West Texas Oil & Royalty 7-C University, 2,494 bbl., tubing, 400-qt. shot, 2,430-2,695 ft.
Ward field: Brandor Pet. 5 Brandenburg, 58 bbl., tubing, 140-qt. shot, 2,040-2,130 ft.

Winkler County

Keystone field: Ralph Lowe 5 Campbell, 401 bbl., casing, 500-qt. shot, 3,096-3,290 ft.
Magnolia 59 Walton, old total depth 3,000 ft., deepened to new pay from 3,060-3,210 ft., new initial 105 bbl., 1-in. choke.

SOUTHERN WEST TEXAS DRILLING REPORT

Crane County

Gulf 1-F University, SE SE Sec. 22, Blk. 31, University Sur., drilling 8,359 ft.

Culberson County

Cecil Cothrun 1 Casey-Rounsoville, Sev. 7, Blk. 104, P.S.L. Sur., water from 1,012-20 ft., drilling 1,045 ft.

Ector County

Forest Development Corp. 1 Bradley, SE SE Sec. 18, Blk. 43, Twp. 3s, T.&P. Sur., drilled broken pay 4,350-4,410 ft., bailing and testing, cemented back 4,380 ft., oil coming into hole at rate of 1½ bbl. hourly, P.B. 4,362 ft., treated 1,000 gal., rigging up pump for gage.

Loving County

Sloan & Zook 1 T. P. Land Trust, SW SE Sec. 37, Blk. 56, Twp. 1s, T.&P. Sur., Delaware test, first report.
H. C. McAuley 1 E. Hall, SE Sec. 60, Blk. 7, W.&N.W. Sur., S.D. 1,690 ft.

Menard County

Harry Baldwin 1 J. A. Leggett, 760 ft. from W and 900 ft. from S lines, Sec. 1, B.S.&F. Sur., S.D. 575 ft., (corrected depth).

Pecos County

Culbertson & Irwin 1 R. G. Heiner, NE NE Sec. 589, G.C.&S.F. Sur., Ordovician wildcat, drilling 2,840 ft.
S. D. Pattillo 1 O'Neil, Sec. 74, Blk. 10, H.&G.N. Sur., Ordovician test, flowing 46 bbl. from 1,607-58 ft., shot with 140 qt.
S. D. Pattillo 1 Hoffman, SE NW Sec. 6, Blk. 141, T.&St.L. Sur., 2,000-ft. test, S.D. 1,360 ft. (correction).

Reeves County

J. B. Dunnigan 1 A. B. Burchard, SW Sec. 7, Blk. 58, P.S.L. Sur., Delaware test, location.
Roy Johnson 1 Perkins, Sec. 18, Blk. 7-C, P.S.L. Sur., drilling 1,805 ft. last report.

(Continued on Page 78)

Discovery May Link Hapgood And Ringgold Fields

By R. MARNE SANFORD

WICHITA FALLS, Tex., Dec. 2.—The closely watched wildcat, Walter Gant 1 Stine, almost on the Clay and Montague county line and between the Ringgold field of Montague County and the Hapgood field of Clay County, drew new interest as further testing indicated possibilities of commercial production.

The wildcat has been testing for several weeks from a horizon different from those two producing in either of the adjacent fields, but to date the water flow exceeded the oil flow. During the past week some sort of an oil producer was promised, even though it has been temporarily shut down for orders. The wildcat topped the Nocona lime at 5,574 ft. and cored saturation from 5,641-77 ft., total depth. Casing was cemented at 5,569 ft. but when plug was drilled the section showed only salt water. It stood for several weeks after which time the hole was plugged back to 5,545 ft. inside casing. It was drilled out to 5,600 ft., casing swabbed dry, and then it swabbed oil at the rate of about 1 gal. per hour. The water has been successfully shut off and it is the reported intention of the operators to drill a few more feet out in the bottom of the hole and again test for a greater volume of oil. Should commercial production result it would mark another discovery from another pay level for the large structural "high" which already embraces the Hapgood, Ringgold and the Worsham fields.

Vogtsberger Field Outposts

Outposts were nearing the crucial stages at two points in the recently opened Vogtsberger area of northeastern Archer County. W. B. Omohundro 1 Browning, Block 7, G.E.C. Survey, ½ mile northwest of the discovery well, early in the week drilled oil shows at the 3,900-ft. level and later in the week found increases below 4,000 ft. Latest shows were found from 4,070-85 ft. in tight, hard sand, 4,086-95 ft. in medium hard sand, and from 4,095 to 4,101 ft. in soft sand. Drilling was halted to run a drill-stem test of the section before going deeper. This horizon was found and carried a show of oil in the discovery well, however, testing failed to net commercial production. The regular producing horizon in the field is about 700 ft. deeper.

About 2 miles northeast of the Vogtsberger field Walter Gant 1 Hunter, Section 7, Block 1, G.E.C. Survey, drilled shows of oil from 3,898 to 3,912 ft. but was drilling ahead. A slight show of oil was found from 3,954-57 ft. and it was last reported drilling below 4,100 ft.

SUMMARY OF COMPLETIONS

NORTH TEXAS

Fields—	No.	Prod.	Footage
Oil wells	31	*13,135	75,305
Dry holes	11	.....	13,851
Total completions	42	.....	89,156

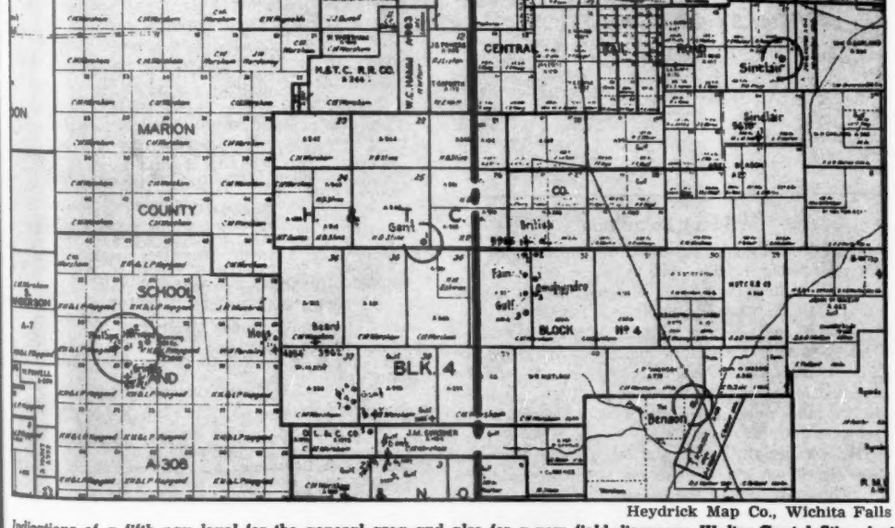
WEST CENTRAL TEXAS

Fields—	No.	Prod.	Footage
Oil wells	6	*831	14,497
Gas wells	1	†9.7	1,284
Dry holes	1	....	1,415
Total completions	8	.....	17,196

*Barrels. †Million cu. ft.

Griffin Field

The Griffin field of Archer County was extended ¾ mile to the north at the close of the week by one of the largest producers in Archer County outside of the Hull-Silk field. It was Jack Kadane 1 Griffin, Block 13, Palo Pinto County School Lands Survey. Producing from the Strawn sand from 4,337-51 ft., the well tanked 650 bbl. of oil in 7 hours, flowing through open casing. The well is expected to stimulate drilling in this 2-year old and little developed field due to the fact that it checked some 35 ft. higher, structurally, than the nearest producer in the field proper.



Heydrick Map Co., Wichita Falls

Indications of a fifth pay level for the general area and also for a new field discovery, Walter Gant 1 Stine, just west of the Ringgold field in Montague County, is testing for completion. The encircled area to the west is the Hapgood field which has already been given two producing levels, while southeast of the Hapgood field is the old Worsham field. The two tests, one northeast and the other southeast of the Ringgold field, are both active wildcats

Hull-Silk Deep Test

With numerous pay levels already opened in the prolific Hull-Silk field of northern Archer County, location was staked for a deep 5,500-ft. test which will seek even a deeper pay for the field. It is J. H. Massie et al Wichita Falls, 22 A. P. Nichols, 330 ft. from the north and east lines of Lot 2, Block 30, A.T.N.C.L. Survey.

NORTH TEXAS COMPLETIONS

Archer County

Holliday field: J. L. Alexander 1 White, 6 bbl., 445-57 ft.
J. L. Alexander 3 White, 4 bbl., 453-65 ft.
Bert Ligon 10 White, 9 bbl., 962-67 ft.
Whitehill Oil 29 Morrison, 4 bbl., 659-70 ft.
Hull-Silk field: Helmerich & Payne 3 Moss, 77 bbl., 3,984-4,020 ft.
King Oil 8 Wilson, 414 bbl., 3,824-44 ft.
Olney field: R. Horany 2 Phillips, dry at 1,180 ft.
Archer field: Still & Scholl 1 Andrews, dry at 952 ft.
Trentman Co. 1 Prideaux, dry at 806 ft.

Clay County

Thornberry field: Akin 1 Lomas, dry at 1,214 ft.
C. U. Beasley 2 Hull, dry at 1,631 ft.
Cannon & Cunningham 1 Hansard, dry at 394 ft.
Gilchrist & Boswell 1 Hamilton, 8 bbl., 258-68 ft.
Johnson & Kouri 4 Taylor "Elliott," 10 bbl., 262-68 ft.
Johnson & Kouri 1 Taylor "Blk. 39," 10 bbl., 1,131-40 ft.
Johnson & Kouri 1 Taylor "Blk. 43," dry at 1,353 ft.
Antelope field: Shell 1 Henderson, 1,848 bbl., 3,191-3,246 ft.

Cooke County

Muenster field: Bridwell Oil 4 Flusche "B," 10 bbl. 755-75 ft.
Bridwell Oil 8 Flusche "B," 60 bbl., 792-802 ft.
Trumpter Oil 12 Stacey, 21 bbl., 760-68 ft.
Walnut Bend field: Sinclair Prairie 2 Timmis, 945 bbl., 4,887-4,903 ft.

Foard County

Thalia field: H. B. Wallace 1 Gamble, 32 bbl., 2,345-67 ft.

Jack County

Bryson field: Panhandle Ref. 4 Leffel, 19 bbl., 2,963-81 ft.
Mathis field: Steed & Wilson 1 Barry, dry at 3,182 ft.
Worsham I Leach, 275 bbl., 2,890-2,915 ft.

Montague County

Nocona field: J. M. Hawley 2 Bouldin, 10 bbl., 802-13 ft.
Ringgold field: W. B. Omohundro 4 Seay, abandoned location.
Bonita field: Sinclair Prairie 4 Howard, 4,453 bbl., 5,240-54 ft.
Rogers & Rogers field: Stanolind 4 Davis, 1,384 bbl., 5,278-5,306 ft.

Wichita County

K.M.A. field: Fain-McGaha 5 Griffin, 865 bbl., 3,716-3,810 ft.
Hammon 33 Fassett & Tuttle, 9 bbl., 1,295-1,311 ft.
Hanlon-Buchanan 25 Fassett & Tuttle, 303 bbl., 4,018-53 ft.
Palmer & Chenault 6 Waggoner "D," 520 bbl., 3,676-81 ft.
Electra field: L. V. Hull 15 Burnett, 1,434 ft., dry.
L. V. Hull 8 Burnett, 630 ft., dry.

Wilbarger County

K.M.A. field: J. A. Woods 9 Womack, 960 bbl., 3,975-4,027 ft.

Young County

Olney field: H. Craig 1 G. C. Wright, dry at 1,075 ft.
A. Fisher 18 Graham, abandoned location.
M. J. and Lucey Grove 7 Barrett, 5 bbl., 577-79 ft.
W. F. Palmer 10 Campbell, 10 bbl., 970-85 ft.
J. W. Parks 2 Fay Clark, 50 bbl., 876-85 ft.
D. L. Wolf 1 Rogers, dry at 930 ft.
Graham field: T. D. Humphrey 3 Jeffery, 75 bbl., 4,810-50 ft.
Ray Oil and Nash 2 Horn, 1,590 bbl., 3,950-4,092 ft.
A. T. Strong 1 Weaver, 13 bbl., 4,730-4,803 ft.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Dec. 2.—Deep exploratory tests were staked in Eastland, McCulloch and Throckmorton counties, and field outpost activity was reported for the Akard field of Jones County and the Nowles field of Jones and Haskell counties.

An Ordovician test is preparing to get under way in Eastland County and about 4 miles north of Cisco. It is Hickok Producing & Development Co. 1 J. L. Gray and W. P. Luse, located 1,170 ft. from the north and 467 ft. from the east lines of Section 486, S.P. Survey. The contract depth is set at 4,250 ft. or the Ordovician pay found in a gas well just ½ mile to the south. The gasser was completed 2 years ago by Lone Star Gas Co. in the K. D. Holland lands and is about 5 miles southeast of three deep producers drilled some 4 years ago. It is also still classified as a

(Continued on Page 70)

By
STAFF CORRESPONDENT

Falls City Development Slows Down, Lacking Outlet

ST. JOSEPH, Mo., Dec. 1.—An offset drilling campaign at Falls City, Neb., has been virtually at a standstill in recent days, though several interesting wildcat tests are going down or being shaped up. The Ohio Oil Co. has five to eight offsets to drill, but to date no plans for the actual work have been announced. While the outlet situation remains as vague as it is at present the company will not need to hurry.

Two new small refineries, one at Salem and one at Falls City, will have a total daily capacity of 4,500 bbl. when arrangements are made with the producers. At this time no arrangements have been announced and it looks rather unlikely that larger operators will make deals with the refineries. Some oil is going out in fulfillment of contracts made early in the game, but generally speaking the movement of oil from the field is slow. Larger operators would like to see a pipe-line company come in and buy oil from all producers on a ratable basis.

In the Falls City pool R. L. Campbell and his St. Joseph associates are building derrick for their fourth well, 4 Schock in SW SE SW Section 20-1n-16e. In some reports this well will be referred to as 2 Dora Schock. Property of William Shock and his wife, Dora Schock, is on record under both names. Phillips Petroleum Co. took the various tracts under a blanket lease and has been farming them out to Campbell and his associates.

Skelly Oil Co., likewise drilling in the pool, was below 1,700 ft. at 3 Wallraff in SE NW SE 20-1n-16e. E. J. Shaffer found Hunton lime at 2,260 ft. in 3 Sandrock, NW SW NW 20-1n-16e, Richardson County. First reports following the drilling in were that Shaffer had excessive water in the new well. A squeeze job did not help greatly at 1 Sandrock in NE SW NW 20-1n-16e. That well also was making excessive water.

As to wildcats, Taylor Drilling Co. of Centralia, Ill., was nearing Hunton lime after topping Mississippi lime at 1,994 ft. in 1 Walmsley, C SW NW 8-1n-16e, Richardson County. This is three-quarters of a mile north of production. Robert McIntyre 1 Hill-Hough in C SE SW 6-1n-16e, set 8-in. casing at 1,605 ft. and drilled to 1,848 ft., where it stopped to underream. Liberty Development Co., a St. Joseph syndicate, was building derrick 2½ miles north of production, at 1 Fehr in NW SE 31-2n-16e, Richardson County.

Indian Territory Illuminating Oil Co. was building derrick for 1 Anthony Ege in C NE SE 19-3n-16e, Richardson County, three-quarters of a mile northwest of its own 1 Schaible-Kuttler in the Shubert neighborhood. In the same neighborhood, W. H. Martgan, of Hollywood, Calif., set surface pipe at 1 Ellen Smith in C NW NW 31-3n-16e.

In Nemaha County, Nebraska, Jackson & Rust were drilling below 700 ft. at 1 Louis Shaffer, SE SE 19-4n-16e.

In Iowa W. G. Osborn, pioneer Forest City basin geologist, confirmed reports of his location and announced that a location he had picked would be drilled in northwestern Fremont County, about 2 miles northwest of Thurman. This is to be 1 Lucas in SW NE SE 28-70n-43w. Rig is up and tools are to arrive immediately. J. A. Johnson of Centralia, Ill., is financing the test and J. B. Barnes has the contract.

Working again in Holt County, Missouri, Flory and Kilby ran 126 ft. of surface pipe at 1 Meyer in SE NE NW 27-62n-39w. More was to be run. Jackson and Rust have derrick up for 1 June Hays, northwest of Watson in Atchison County, Missouri, C NE NE 22-66n-42w.

Five core drills are reported working back and forth across the line between Atchison County, Missouri, and Fremont County, Iowa. Two belong to Skelly and two to the Ohio, it is stated. Identity of the fifth party was not learned.

NEBRASKA COMPLETIONS

Pawnee County

Black Gold 1 Bernadt.....C NW NE 31-3-11
Dry, T.D. 735 ft., Lansing 565 ft., granite 675 ft.

Nemaha County

Ray Pulliam 1 Lawrence.....SE cor. 34-5-15
Dry, T.D. 2,518 ft., Hunton 2,506 ft.

Palanski et al 1 Dolhke.....C NE NE 14-3-12
Dry, T.D. 733 ft

NEBRASKA DRILLING REPORT

Lancaster County

Krueger 1 Roe.....SE SW SW 5-7-7
Lansing 780 ft., drilling 940 ft.

Nemaha County

Frank Engles 1 Wheeler.....NE cor. 9-4-14
Hunton 2,658 ft., drilling 2,668 ft.

Richardson County

McIntyre et al 1 Hough-Hill.....C SE SW 6-1-16
Fishing 1,850 ft.

IOWA DRILLING REPORT

Smythe et al 1 Hook.....C NE NW 18-69-35w
T.D. 1,100 ft., casing collapsed, to skid rig.

KANSAS

Wildcat activity in Kansas hit a new low last week with only three tests being reported in unexplored territory.

Scouts blamed the wet weather and muddy roads, which made travel virtually impossible in many areas, for the slump.

Influence of the weather was reflected in the new operations in the established areas also, only 22 new tests being reported for the week as compared to 46 for the preceding week.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Nov. 30	Nov. 23
Burrton	7,350	7,300
Ritz-Canton	3,800	3,800
Graber	2,250	2,500
Hollow-Nikkel	1,450	1,400
Voshell	1,850	1,800
Wellington	1,600	1,500
Lorraine	1,150	1,150
Stoltenberg-Wilkins	4,915	4,725
Bloomer	5,050	5,000
Chase	4,100	5,750
Geneseo	4,250	3,700
Silica	18,450	17,350
Keesling	1,050	650
Wherry	3,150	2,800
Trapp district	15,200	16,750
Balance Russell County	19,850	17,450
Sedgwick County	3,200	3,150
Bemis	8,450	9,300
Burnett	5,150	5,450
Kingman County	650	1,020
Stafford County	11,380	9,735
Greenwood County	8,100	8,150
El Dorado	7,000	7,050
Total Kansas	196,650	190,850

SUMMARY OF COMPLETIONS

Fields—	No.	Prod.	Footage
Oil wells	15	*15,462	42,860
Gas wells	2	†106.5	8,080
Dry holes	3	.....	8,156
Wildcat—			
Dry holes	6	.....	20,569
Total completions	26	.....	79,665

*Barrels. †Million cu. ft.

Wildcat Locations

Stafford County got two of the wildcat locations this past week while the third was in Barton County.

Zephyr Drilling Co. has set surface pipe and is drilling at 1 Henry E. Moon, in S½ SE NW 30-22-13w, 7 miles north and 2 east of St. John, in Stafford County.

James McMorrow, Wichita, and Perry A. Thayer and Kiowa Drilling Co. of Wichita and Salem, 1 Hutchinson Investment Co., in the NW SE of 12-22-14w, a wildcat test 1½ miles south and 1 mile west of Seward, is preparing to move in materials.

Transwestern Oil Co. et al 3 fee, a semiwildcat test three-eighths of a mile west and north of production in the Breford pool of Barton and Ellsworth counties, has been staked in the CEL SW SE of 12-17-11w, in Barton County.

KANSAS COMPLETIONS

Barton County

Wildcat: Shell 1 Homolka, NE NE SE 24-16-11w, dry, T.D. 3,468 ft., Topeka 2,693 ft., Lansing 3,071 ft., Sooy 3,365 ft., Arbuckle 3,441 ft.

Butler County

Miscellaneous: Rex & Morris 5 Sutter, NE SE NE 7-28-7, pumped 35 bbl., Bartlesville 2,601-48 ft., T.D.

Edwards County

Wildcat: McKnab et al 1 Minet, C SW SW 15-25-17w, dry, T.D. 5,010 ft., Topeka 3,470 ft., Lansing 3,982 ft., Mississippi lime 4,499 ft., Viola 4,597 ft., Simpson 4,806 ft., Arbuckle 4,884 ft.

Ellis County

Burnett pool: L. H. Wentz 2 Riddler, NL SW SW 1-11-18w, est. 200 bbl., Arbuckle 3,525-29 ft., T.D.
Darby Pet. 2-C Peavey, NL NE NE 24-11-18w, pumped 284 bbl. in 8 hr., Arbuckle 3,413-49 ft., T.D. 3,458 ft., 1,000 gal. acid.
N. Victoria area: Gulf 1 Kuhn, NL SE SW 30-13-16w, dry, T.D. 3,580 ft., Lansing 3,258 ft., Arbuckle 3,503 ft.

Ellsworth County

Wilkins pool: Cities Service 3 Wessler, C N½ NW SE 19-17-9w, maximum potential 3,000 bbl., Arbuckle 3,217-36 ft., T.D.
Stoltenberg pool: Lario O. & G. 8 Mehl, C S½ SW SE 35-16-10w, maximum potential 3,000 bbl., Arbuckle 3,269-80 ft., T.D.

Greenwood County

Wildcat: E. W. Creel et al 1 Stonebreaker, W½ E½ SW 32-27-11, dry, T.D. 1,305 ft.
Virgil pool: Henderson 3 Schneider, NE SE SW 9-23-13, pumped 15 bbl., Mississippi lime 1,788-1,802 ft., T.D.

Kingman County

Cunningham pool: Skelly 1-G Miles, C NE SE 30-27-10w, flowed 53,000,000 cu. ft. gas daily, Viola 4,023-40 ft., T.D.
Cunningham pool: Skelly 3-G Miles, C NE SE 30-27-10w, gaged 53,500,000 cu. ft. gas, Viola 4,022-40 ft., T.D.

McPherson County

Bornholdt pool: Cities Service 4 Nyquist, C S½ NE NW 19-20-5w, pumped 98 bbl. in 8 hr., Mississippi lime 3,307-38 ft., T.D.
H. C. Bennett 3 Knackstedt, N½ SW SW 30-20-5w, pumped 47 bbl., Mississippi lime 3,285-3,356 ft., T.D.
Roxbury pool: Westgate-Greenland 2 Reese, C S½ NW NW 19-17-1w, 2,098 bbl., T.D. 2,710 ft., Mississippian chat.

Rice County

Geneseo pool: Continental et al 2 Root, SE NE NE 36-18-8w, swabbed 60 bbl. an hour in 4-hr. test, Arbuckle 3,231-39 ft., T.D.

Rooks County

Wildcat: Palmer Oil 1 Denio, EL SW NE 17-8-16w, dry, T.D. 3,337 ft., Topeka 2,720 ft., Lansing 2,995 ft., Arbuckle 3,310 ft.
Layton pool: Cooperative 4 Beardmore, NL SW NE 10-9-16w, maximum potential 3,000 bbl., Lansing 3,149-3,215 ft., T.D. 8,000 gal. acid.

Russell County

Coralena pool: Coralena Oil 1 Meharg, SE NE SE 18-15-13w, dry, T.D. 3,271 ft., Topeka 2,711 ft., Lansing 3,006 ft., Arbuckle 3,267 ft.
Hall-Gurney pool: Coralena 3 Phinney, N½ NE NE 30-14-13w, pumped 144 bbl. 8 hr., Lansing 2,908-16 ft., T.D. 2,919 ft.
Skelly 2 Ehrlich, C N½ NW SW 32-14-13w, pumped 186 bbl. 8 hr., Lansing 2,882-2,965 ft., T.D.
Skelly 7 Rein, S½ NW SW 25-14-14w, pumped 392 bbl. 8 hr., Lansing 3,010 ft., T.D.

Stafford County

Sittner pool: Helmerich & Payne 2 Krug, EL NW SW 2-22-12w, pumped 55 bbl. 8 hr., Arbuckle 3,603-13 ft., T.D.
Wildcat: Bradley Bros. 1-A Davis, WL SW SW 32-23-12w, dry, T.D. 3,987 ft., Topeka 2,985 ft., Lansing 3,475 ft., Viola 3,799 ft., Simpson 3,905 ft., Arbuckle 3,972 ft.

Sumner County

Wildcat: Shawver et al 1 Knowlton, WL NW SE 6-33-2, dry, T.D. 3,836 ft., Kansas City 2,890 ft., Mississippi lime 3,413 ft., base Mississippi 3,720 ft., Simpson 3,768 ft., Arbuckle 3,826 ft., water in Mississippi, Simpson, and Arbuckle.

KANSAS DRILLING REPORT

Barber County

Barbara Oil 1-A Angell.....C NE SE 10-33-14w
T.D. 5,291 ft., P.B. 5,062 ft., 40 qts. 5,047-58 ft., cleaning out.

Barton County

Continental 1 Karst.....NW NE NW 12-16-15w
Drilling 1,883 ft.
Owens et al 1 Burmeister.....C S½ SE NW 20-17-11w
Lansing 3,120 ft., drilling 3,275 ft.
Allen et al 1 Benjamin.....C W½ SW SE 3-19-13w
Drilling 1,120 ft.

Ellis County

Stearns Drlg. 1 Witt.....C S½ NE SW 28-12-16w
Drilling 2,500 ft.
Central Pet. 1 Wellbrock.....NW NW NE 32-14-16w
Drilling 750 ft.

Greenwood County

Lewis & Dunn 1 Keller.....C E½ NE SW 22-26-13
Set 5-in. casing 1,440 ft.

(Continued on Page 69)

By
STAFF CORRESPONDENT

Stephens County Trend Play Leads Oklahoma Activity

DESPITE the rain and muddy roads over the past week, wildcat operations picked up throughout the state with 12 new wells reported. A resume of the state showed 48 wildcats drilling, 8 rigs and 19 inactive.

In Stephens County Skelly Oil Co. staked location for a Hunton lime test with its 1 Robberson-Frensley, C NE NE 35-1s-5w, and shut down because of rain. Skelly's Stephens County block includes acreage in Sections 25, 26, 27, 35 and 36 in 1s-5w; Section 31 in 1s-4w, Sections 6 and 7 in 2s-4w and Sections 1, 11 and 12 in 2s-5w.

Major companies continue to add to their leaseholds in Stephens County, where a number of wildcat deals are brewing on an extensive "trend" play between old fields.

The Texas Co. took 5-year leases on the E½ SW of Section 26, and E½ NW of 34-1n-4w. Gulf Oil bought part of NE 21-1n-4w. Phillips Petroleum took the SW SE 4-2n-5w. Gulf Oil has recorded leases in Sections 11, 12, 13 and 14-2n-5w, in its block south of the Knox field where it is starting a deep wildcat test.

Carter Oil took 5-year leases on the SE SW NE and SW SE NE of 8, and lots 2, 3 and 4 and SW NE of 5-1s-5w. Gulf bought the N½ NE NE and SW NE NE and NW NE of 15-1s-4w. Sinclair-Prairie took most of the NW of 13-2s-6w.

Wildcat Operations

Hamblin Good and Litterall 1 Phillips, NE NE NW 34-1-13w, Comanche County, was a location. J. E. Trigg et al 1 Jennings, NW SW NE 18-16-8, was rigging up; R. R. Kirchner 1 Carson, NE SE NW 23-17-9, Creek County, location. C. O. Taylor et al 1 Schussler, SW SE NE 14-6s-14, Choctaw County, was building derrick. Danciger 1 Hefner, SE SE 3-4s-4w, Jefferson County, staked location for a 4,250-ft. test. L. A. Cullison et al 1 Casemore, SE NE NW 15-26-1, Kay County, location. In Lincoln County Mid-Continent Petroleum 1 School Land, NW NE NE 36-12-3 and Herndon Drilling Co. 1 Ladrax, SE SE SW 10-12-5, were locations.

Lovell Field

The new play on southeast flank of the old Lovell field in Logan County received its first setback during the week when the Big Chief Drilling Co. and Kenneth Ellison 1 Strange, in C SW SE of 27-18-4w, drilled to 5,125 feet, apparently missing the Layton series and being dry all the way.

Electric-log survey and cuttings showed possibilities in the Avant at 4,250-70 ft. and operators were planning to set casing and test this zone. Testing probably will be made in a week.

Testing was under way Saturday at the H-P Gas 2 Matherson, in C SE SW of 34-18n-4w, which had the Layton at 4,829-74 ft., total depth 4,879 ft. No gauge was reported, but the well was showing for a combination oil-gas producer.

SUMMARY OF COMPLETIONS

Fields—	No.	Prod.	Footage
Oil wells	10	*1,802	25,299
Gas wells	2	†37.3	7,838
Dry holes	5	.....	15,190
Wildcats—			
Oil wells	1	*25	2,741
Gas wells	1	†1.0	2,407
Total completions	19	.....	53,475

*Barrels. †Million cu. ft.

OKLAHOMA COMPLETIONS

Bryan County

Pure 1 Little 106 ..... SW SW 27-5s-7
Flowed 382 bbl. in 19½ hr. through 1-in. choke, sand 4,775 ft.

Carter County

Lamb 2 fee ..... CNL 29-4s-2w
Pumped 50 bbl., shale sand 2,292-96 ft., T.D. 2,325 ft.
Magnolia 82 Richards ..... CSL 31-3s-3w
Pumped 65 bbl., sand 1,070-1,128 ft.
Porterfield 2 Walker ..... SW SE 17-4s-2w
Pumped 125 bbl., sand 2,175-2,219 ft., T.D.
Daube 1 Woodruff ..... NW NE NE 18-4s-2w
Dry, T.D. 2,501 ft.
Gibson 3 Griffin ..... NE SE SE 20-4s-2w
Pumped 225 bbl., sand 2,121-45 ft., T.D. 2,171 ft.

Creek County

Bruin 1-A Tiger ..... SE SW 9-14-10
Dry, T.D. 3,346 ft., Misener 3,231 ft., show oil, Hunton 3,260 ft., Viola 3,278 ft., Wilcox 3,312-46 ft.
Tibbens 2-A Harry ..... SE NW NW 9-14-10
Flowed 35 bbl., Misener 3,150-66 ft., T.D., shot 3,156-66 ft.

Jackson County

Doss 1 Robertson ..... NE NW SE 15-1-20w
Pumped 22 bbl., top pay 1,528-34 ft., T.D. 1,549 ft.

Lincoln County

Buell 2 Thomas ..... CEL SE SW 10-13-6
Flow 33,000,000 cu. ft. gas, Hunton 4,113 ft., rock pressure 1,200 lb.

McIntosh County

Pine 1 Fuller, Wildcat ..... NW SE NW 13-11-16
Flow 1,000,000 cu. ft. gas, sand 2,406-07 ft., T.D.

Okfuskee County

Burke-Greis 1 Scott ..... C NW SE 20-10-10
Dry, Hunton 3,744-45 ft., T.D.
Texas 1 Martin ..... NE NE 7-11-10
Flow 4,300,000 cu. ft. gas, Hunton 3,652 ft., T.D. 3,725 ft.
Droppleman 4-C Dill ..... SE NE 34 12-8
Flowed 840 bbl., Cromwell 3,640 ft., T.D. 3,680 ft.

Pottawatomie County

Patterson 2 Edwards ..... NW SE SE 28-6-5
Flowed 25 bbl., Earlsboro 2,746 ft.

Seminole County

Hall 3 White ..... NW SE 30-6-8
Dry, T.D. 2,612 ft., Gilcrease 2,605 ft.

Stephens County

Pace 1 Miller, wildcat ..... NW NE NW 13-3s-5w
Pumped 25 bbl., T.D. 2,741 ft. in Arbuckle, plugged back to 952 ft.
Winkler 1 Winters ..... SW SE SE 10-1s-8w
Temporarily abandoned, T.D. 2,986 ft.
Stogner 1-A Bush ..... NE SW 3-2s-8w
Pumped 8 bbl., sand 1,524 ft., T.D. 1,540 ft.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Nov. 30	Nov. 23
Allen	5,000	5,000
Billings	6,250	6,225
Burbank	7,400	7,050
South Burbank	7,325	7,150
Balance Osage	17,200	16,900
Blackwell district	3,350	3,325
Bristow-Slick	6,250	6,050
Chandler	1,050	1,050
Crescent	2,100	2,025
Cromwell	2,950	2,950
Cushing-Shamrock	9,225	9,100
Duncan	3,550	3,550
Edmond	3,950	3,950
Fish	3,000	3,000
Fitts	14,700	14,750
Jesse	2,050	2,050
Graham-Fox	2,250	2,275
Gray	850	850
Healdton	8,500	8,500
Hewitt	6,050	5,750
Keokuk	2,900	2,875
Konawa	1,100	1,075
Lucien	6,850	6,875
Moore	1,150	1,175
Northeastern counties	18,500	17,300
Oklahoma City	95,250	96,350
Olympic	1,800	1,800
Ramsey	3,600	3,600
Sasakwa	1,425	1,400
Sholem-Alechem	2,575	2,573
Seminole district:		
Bowlegs	6,450	6,500
Carr City	2,125	2,125
Dora	1,750	1,750
Earlsboro	3,900	3,900
East Earlsboro	1,800	1,800
South Earlsboro	450	475
Little River	6,325	6,350
East Little River	650	650
Maud	550	550
Mission	1,200	1,200
Seminole	6,275	6,400
East Seminole	1,100	1,075
Searight	1,925	1,975
Total Seminole	34,500	34,750
St. Louis-Pearson	22,150	22,250
Tatums-Tussy	4,650	4,400
Tonkawa-Garber-Thomas	3,550	3,550
Wewoka	1,550	1,600
Yale-Jennings	3,050	2,975
Total Oklahoma	403,500	400,925

OKLAHOMA WILDCAT DRILLING REPORT

Comanche County

Hilton Phillips 1 Reick ..... NW NW SW 29-4-10w
Pontotoc 1,200-1,795 ft., T.D. 2,820 ft., S.D.

Hughes County

Ed Scruggs 2 Black ..... NW NE NE 13-9-10
Drilling 1,970 ft.
Magnolia 1 McKoy ..... SW SW SE 16-5-11
Cromwell 5,373 ft., drlg. 5,410 ft.

Kay County

Union Nat. 1 Long ..... NW cor. 29-28-1
Drilling 2,595 ft.

Logan County

Big Chief & Ellison 1 Strange .. C SW SE 27-18-4w
Drilling 4,776 ft.
I. T. I. O. 1 Cronkite ..... NE NE NW 22-15-4w
Drilling 2,660 ft.

Muskogee County

Storm Feltz & Hyde 1 Moore .. NW SE SE 4-14-17
Drilling 275 ft.

Noble County

Adams et al 1 Albright ..... SW SW SE 31-23-2w
Drilling 500 ft.

Okfuskee County

Vierson O. & G. 1 Meyers .. SE NE NE 1-11-6
Mayes 4,100 ft., Woodford 4,182 ft., Misener 4,207 ft., dry, Hunton 4,216 ft., dry, Viola 4,472 ft., drlg. 4,485 ft.
Portable Drlg. 1-A Nelson ..... NE SE SW 1-11-9
Sylvan 3,940 ft., Viola 4,030 ft., dense 4,058 ft., dolomite 4,062 ft., first Wilcox 4,075 ft., T.D. 4,108 ft., S.D.
Fred Coogan 1 Davis ..... SW SE NE 20-11-9
Drlg. 2,609 ft.
Henry Oil 1 Dudgeon ..... NE SW SE 36-12-9
Drilling 1,475 ft.

Oklahoma County

Harper-Turner 1 Harper ..... NW NW SW 17-14-2w
Drilling 2,145 ft.

Osage County

Brookhaven Oil 1 Osage ..... NE NE SW 6-22-8
Drlg. 1,785 ft.

Payne County

Helmerich & Payne 1 Freeman .. NW NW SW 2-17-2
Oswego 3,940 ft., Prue 4,075 ft., Mississippi lime 4,430 ft., drlg. 4,464 ft.
Roy Starr 1 State ..... C W½ SW SW 16-20-2
Upper Layton 3,290 ft., lower Layton 3,532 ft., drlg. 3,866 ft.
J. E. Crosbie 1 Moore ..... NE NE NW 29-20-2
Drilling 835 ft.

Pontotoc County

Heintzelman et al 1 Crawford .. NE NE NW 12-4-6
Drlg. 650 ft.
Simpson-Roodhouse 1 Montpelier SW SW NW 20-2-6
Cromwell 2,935 ft., Pennsylvanian Caney 3,055 ft., drlg. 3,105 ft.

Seminole County

Hilton Phillips 1 Thorne ..... NW NE NE 3-7-5
Base Kansas City 1,325 ft., drlg. 3,480 ft.
Alma Oil 1 Borden ..... NE SE NW 4-8-8
Earlsboro 2,375 ft., Booch 3,025 ft., Gilcrease 3,150 ft., Cromwell 3,310 ft., show oil, drilling 3,360 ft.

Woods County

Gulf 1 Hess ..... C NE NW 33-23-13w
Big lime 5,890 ft., Oswego 6,210 ft., drilling 6,700 ft.

Kansas Fields

(Continued from Page 66)

Jefferson County

Davis-Helm 1 Green ..... SW SW NW 9-11-19
Drilling 290 ft.
Caufield & Sullivan 1 Ragan ... SW SW SE 19-10-20
Drilling 75 ft.

Johnson County

McCain, Sherrod et al 1 Doan C E½ NW SE 34-12-22
Old well drilling deeper. Simpson 1,575 ft., Wilcox 1,590 ft., T.D. 1,692 ft., S.D.

Leavenworth County

McLaughlin & Sons 1 Thorp .... C NE NE 27-10-20
T.D. 1,100 ft., S.D.

Ness County

Aladdin Pet. 1 Jedlicka ..... C NE NE 33-20-23w
Drilling 2,400 ft.

Rice County

Hess et al 1 Cole ..... SE SE NE 31-20-6w
Lansing 2,910 ft., drilling 3,030 ft.

Russell County

Pryor & Lockhart 1 Borrell C N½ NE SE 3-15-11w
Topeka 2,440 ft., Lansing-Kansas City 2,682 ft., show oil, T.D. 2,886 ft.

Thomas County

Billings et al 1-A Ryan ..... C E½ NE SE 27-8-32w
Drilling 3,125 ft.

TEXAS GULF COAST

Important Wildcats Staked as Floods Impede Drilling

By NEIL WILLIAMS

HOUSTON, Tex., Dec. 2.—Development in many sectors of the Texas Gulf Coast district was temporarily halted during the week as several rivers reached flood stage as the result of heavy rains throughout the state the previous week. Drilling in many proven fields was halted, and numerous wildcats were forced to close down due to flooded conditions. This resulted in a quiet week for the district, and several days will be required before normal development is resumed.

Locations for important wildcats were announced for Brazoria and Harris counties, and material is scheduled to be moved in at an early date. Southwest of Chenango, Brazoria County, J. Newton Rayzor staked location for 1 James Christian, a projected 9,500-ft. test located on a Sun Oil Co. farmout lease in the William Parker Survey. Leasing and royalty buying in this area has been active for the past few months,

SUMMARY OF COMPLETIONS

Fields—	No.	Prod.	Footage
Oil wells	9	*2,611	58,027
Dry holes	1	.....	5,265
Wildcat—			
Dry hole	1	.....	8,091
Total completions	11	.....	71,383

*Barrels.

and the area has been generally recognized as an attractive prospect for several years.

In the Cypress area, Harris County, George Echols and John Mayo staked location for 1 Hardison in the J. W. Moody Survey. The well is located on a 1,000-acre farmout lease from Gulf Oil Corp. and is situated about 1 mile northeast of Gulf 1 Roberts, a dry hole which is reported to have logged several interesting showings, but no test was ever made, and the well was listed as a temporarily abandoned hole for several months. The well is scheduled to be drilled to a depth of 7,500 ft.

Ogburn Field

On the north side of the Ogburn field, Harris County, L. M. Josey continues to test 1 Josey, and the well is reported to be cleaning out from perforated casing at 6,616-19 ft., showing gas and distillate. Tubing pressure was 100 lb., and casing pressure 800 lb. This well was reported the previous week as opening crude production from sand at 7,020-24 ft., but due to salt-water intrusion it was killed and recompleted at the present depth. A previous test at 6,655-57 ft. recovered salt water. Offsetting the discovery well to the south, Joyce Richardson and Christian-Carpenter Drilling Co. 1-A Backen is bottomed at 6,939 ft., and operators are attempting to make a drill-stem test. Two drill-stem tests earlier in the week showed promise of production. A 14-minute test at 6,449-59 ft., recovered 360 ft. of pipe-line oil and tested 500 lb. working pressure, while a 20-minute test at 6,459-67 ft. recovered 1,800 ft. of fluid, 720 ft. of which was salt water and the balance pipe-line oil.

In the Dyersdale field, Harris County, H. C. Cockburn 5 Burkett is bottomed at 4,120 ft., and 5½-in. casing is being cemented for completion. Sand and sandy shale with an oil odor was cored at 4,057-72 ft. The operator's 8 Burkett, which has been in the process of completion for several weeks, is reported to be flowing 75 bbl. per day on gas lift.

Another producer was indicated for the Rowan field, Brazoria County, as Humble Oil & Refining Co. prepared to complete 2 Hubbard. Ten feet of sand showing oil was recovered in a core at 8,530-41 ft., and casing was cemented following the running of an electrical survey. The well is a northwest offset to the company's 1 Hubbard which extended the field to the north several weeks ago.

In the Chocolate Bayou area, Brazoria County, Phillips 1 Triangle Development Co., 1 mile east of the discovery well which is tied up with a fishing job at a total depth of 10,180 ft., is reported to have logged the following showings: sand and shale with a gas odor 9,874-9,905 ft., and 9,921-36 ft., and sand with an oil odor and cut in ether at 9,945-56 ft.

Galveston Bay Test

In the Red Fish Reef area, Galveston Bay, Chambers County, and 1 mile northwest of the discovery well, Humble 3-A-248 State, failed to flow when tested through perforated casing at 10,327-33 ft., and further testing will be delayed as the rig is being moved to Southwest Texas, and another rig will have to be moved in. The sand section which is being tested is a new horizon for this area, being several hundred feet deeper than the two producers which have been completed.

To the north and located in the Fishers Reef area, Humble 2-C-46 State, the discovery well which was completed the previous week for an initial production of 187 bbl. per day flowing through a ½-in. choke, has been killed and will be recompleted in an attempt to lower the gas-oil ratio which has shown a gradual increase since completion. Production was obtained by perforating casing in the Frio zone at 8,961-63 ft.

In the Alta Loma field, Galveston County, Stanolind 1 Hulen was being placed on production after it flowed oil and wash water with no showing of salt water while testing through perforated casing at 9,181-84 ft. Tubing pressure was 2,900 lb., and shut-in casing pressure 1,700 lb. This is the second well to be completed on the structure.

Pure 1 Fowler, the second well to be drilled in the newly opened West Ganado field, Jackson County, and located as an offset to the discovery, is drilling in shale below 4,900 ft., and the 5,200-ft. pay should be reached the first of the week.

TEXAS GULF COAST COMPLETIONS

Harris County

Fairbanks field: Amerada 29 Foley, 136 bbl., ⅛-in. choke, perf. casing 6,827½-35½ ft., T.D. 6,838 ft.
Tomball field: Humble 3-A Reuben-Weindorff, 335 bbl., ¼-in. choke, top sand 5,563 ft., T.D. 5,574 ft.

Jackson County

Lolita field: Humble 6-A L. Ranch, 26 bbl. per hr., ¼-in. choke, T.D. 5,931 ft.
West Ranch field: Forest Development Co. 2 Dixon, 157 bbl. fluid, 3 per cent salt water, ¼-in. choke, T.D. 5,810 ft., P.B. 5,760 ft.

Jefferson County

Fannett field: Gulf 7 Bordages, 817 bbl., ¼-in. choke, top sand 8,307 ft., T.D. 8,313 ft.
South China field: Pan American 4 Fontenot, 140 bbl., ¼ in. choke, perf. casing 7,883-88 ft., T.D. 7,901 ft.

Liberty County

Esperson field: W. P. Luse 2 Hlavaty, 161 bbl., ¼-in. choke, perf. casing 6,884-6,900 ft., T.D. 7,008 ft.

Matagorda County

Markham field: Thomar 2 Sisk, 145 bbl., ¼-in. choke, top sand 3,260 ft., T.D. 3,587 ft.

Polk County

Segno field: Gulf 41 Wing, 477 bbl., ¼-in. choke, top sand 8,039 ft., T.D. 8,065 ft.

San Jacinto County

Wildcat: McDannald Oil Co. 1 Coline, dry, T.D. 8,091 ft.

Wharton County

Hillje field: Texas 3 Peters, dry, T.D. 5,265 ft.

TEXAS GULF COAST DRILLING REPORT

Brazoria County

J. A. Gray 1 Ransom, 3 mi. NE Sandy Point field, C. S. Gorbett Sur., drilling shale 5,649 ft.
Phillips 1 Houston Farms Development Co., Chocolate Bayou area, T.D. 10,069 ft., cutting sidewall cores.
Phillips 1 Triangle Development Co., Chocolate Bayou area, T.D. 10,180 ft., fishing.
Skelly 1 MacDonald, SE Pledger field, J. White Sur., S.D. 8,918 ft., high water.

Colorado County

W. R. Davis 1 L. E. Brownston, E. S. Wooley Sur., attempted drill-stem test 9,415-20 ft. but failed, coring shale 9,490 ft.

Matagorda County

Ohio 1 Blackburn, Sugar Valley prospect, Freeman Pettus Sur., coring shale 9,231 ft.

West Central Texas

(Continued from Page 65)

wildcat in that the contract depth is the Ordovician pay, despite the fact that it is also about ½ mile southeast of a field discovery brought in last summer on the C. W. McElreath lands by Groover & Rose and Jones & Stasney. The discovery rated 110 bbl. daily from the Caddo lime from 2,963 to 3,035 ft. following a 4,000-gal. acid treatment.

In McCulloch County, on the extreme south end of the West Central Texas district, W. J. Dillard of Odessa has staked location for 1 E. B. Garrett, a wildcat location 467 ft. from the north and east lines of Survey 934, Abstract 1196. It will be drilled with cable tools and is contracted to the 3,000-ft. level.

Throckmorton County will receive a new deep exploratory operation in the Jack Bell 1 J. B. Putnam. The exact location was not announced, however, it is to be about 14 miles north of the town of Throckmorton and in the C.I.R. Survey 25. The reported projected depth is 4,300 ft. and it will be a combination rotary and cable-tool hole.

Akard Field

In Jones County's Akard field, a ¾-mile northeast extension, completed its official gage late in the week. It is Ungren & Frazier 1-A Dorothea Akard, location being 330 ft. out of the southwest corner of the east 80 acres of the east 141 acres of the north 279 acres of the south half of the G. Martinez Survey 137. The well flowed 177 bbl. of oil in 24 hours from pay drilled from 2,124-35 ft., total depth.

Nowles Outpost Starts

A new outpost for the Nowles field, producing from the Palo Pinto lime and located on the Jones and Haskell county line, was started the past week. It is Hunter & Roberts and Fain-McGaha Oil 1 Strand, located 467 ft. out of the NW cor. E½ NW Section 5, Block 5, H.&T.C. Survey. The location is about ½ mile north of the Hunter 1 Berris, south extensioner, and is about a similar distance southwest of the old original discovery well by Nowles on the Pardue tract. The new test has been spudded and is preparing to drill ahead.

WEST CENTRAL TEXAS COMPLETIONS

Callahan County

Harris field: Chiltipin Oil 1 Ross, 9,740,000 cu ft. gas, 1,257-84 ft.

Coleman County

Novice field: States Oil 7 Morris, 183 bbl., flowing, 30-qt. shot, 3,576-83 ft.

Jones County

Noodle Creek field: Falls Ref. 4 Robinson, 272 bbl., open tubing, 1,874-83 ft.
Lewis field: Sandy Ridge Oil 4 Alton, 180 bbl., 1,900-06 ft.
Reid field: Farrell 2 Mareska, 30 bbl., 3 per cent water, 2,000 gal. acid, 2,576-78 ft.
Farrell 3 Mareska, 20 bbl. oil, 2 per cent water, 2,000 gal. acid, 2,580-84 ft.
Sayles field: Condor Pet. 33 Sayles, 146 bbl., 1,926-46 ft.

Shackelford County

Shackelford field: L. H. Choate 1 Green, dry at 1,415 ft.

TEXAS PANHANDLE

AMARILLO, Tex., Dec. 2.—Severe ice storms the fore part of the past week in the Texas Panhandle somewhat hampered the weekly field activity for the district. Completions dropped to seven, all except one being for oil. The dry hole was I. T. I. O. 1 O'Laughlin, wildcat in Hansford County quit at a total depth of 3,249 ft. According to early intentions of the I. T. I. O. company further exploration in the way of new wildcats was to be expected soon on the large block on the edge of Hansford County, however, unconfirmed reports were the past week that the company would release its block without further drilling.

TEXAS PANHANDLE COMPLETIONS

Carson County

Skellytown field: Clayton & Dwyer Drlg. Co. 1 Schafer, 336 bbl., pumping, 3,090-3,126 ft.
Magnolia 92 fee 244, 462 bbl., pumping, 3,120-3,135 ft.

Gray County

Pampa field: Stanolind 12 Hood, 381 bbl., pumping, 2,961-3,048 ft.
Lefors field: Adams, McGaha 4 Morse, 141 bbl., pumping, 2,630-95 ft.

Hansford County

Wildcat: I. T. I. O. 1 O'Laughlin, SE SE Sec. 2, Blk. 2, W.C.R.R. Sur., dry at total depth 3,249 ft.

Hutchinson County

Borger field: Fraber-Hodges Corp. 5 Ware, 171 bbl., pumping, 2,945-3,040 ft.
Fraber-Hodges Corp. 6 Ware, 299 bbl., pumping, 3,004-3,108 ft.

By GEORGE WEBER

Another Cotton Valley Sand Cored in Deep Lisbon Test

SHREVEPORT, La., Dec. 2.—Further indications of new Cotton Valley formation production were encountered in the deep Caruthers, trustee, 1 Simmons in the Lisbon field of Claiborne Parish this week. The test, shut down with a fishing job for several weeks, after it threatened to blow out in an upper sand, this week was carried deeper and struck further saturation.

The Caruthers test encountered its first deep show in the transitional zone at the top of the Travis Peak formation, which incited the deepening of a nearby well and its completion for discovery well in a new sand in the field. Drilling ahead on the 9,000-ft. contract the Caruthers test encountered the Vaughn sand which is producing in Lisbon Exploration Co. 1 Vaughn to the north. The Vaughn sand in the current test showed a thickening from 8 ft. in the Lisbon Exploration well to 20 ft. in the Caruthers well, and tested an estimated 50,000,000 cu. ft. of gas in the latter, through the drill stem.

Two feet of another sand were cored at 8,676-78 ft. when the test threatened to blow out, and upon killing it, drill stem was lodged. Following completion of the cleanout job last week the test was continued.

A sand expected at about 8,780 ft. promised to be interesting. This section, correlating with a sand which ran 35 ft. in thickness in the Lisbon Exploration test, but was not tested due to mechanical difficulties, was actually topped in the well this week at 8,775 ft. and the section continued to 8,814 ft. showing an overall thickness of 39 ft. Of the entire section, 25 ft. was porous saturated sand, interspersed with tight sand sections. Total depth of the test is now 8,865 ft., and coring has been resumed. There is a possibility that the test may be carried beyond the 9,000-ft. contract depth in view of its success in finding shows in the Cotton Valley formation.

SUMMARY OF COMPLETIONS

NORTH LOUISIANA

	No.	Prod.	Footage
Oil wells	5	*745	11,011
Dry holes	1	.....	762
Injection wells	1	.....	416
Total completions	7	...	12,189
Recompletions	1	*50	.....

SOUTH ARKANSAS

	No.	Prod.	Footage
Oil wells	3	*298	7,216
Dry holes	1	...	3,538
Total completions	4	.....	10,754

EAST TEXAS BORDER

	No.	Prod.	Footage
Dry hole	†	.....	3,035

*Barrels. †Wildcat.

Athens Wildcat to Test

The Athens prospect, well regarded as a possible new field in the Travis Peak or Hosston formation, is due to be tested this coming week. The V. A. Hardin 1 Valentine several weeks ago encountered porous sand at 6,157-70 ft. and was carried to a total depth of 6,507 ft., with 5½-in. casing set at 6,430 ft. Since that time the test was shut down pending title work, and interest in the test has been purchased by Skelly Oil Co. and Sunray Oil Co. Rains may hamper the movement of perforating trucks into the location, but a test may be expected some time during the coming week. The test, known as the Athens prospect, is located west of Sugar Creek in 31-20-6w, Claiborne Parish.

Greenwood Field Test Planned

Testing of Delta Drilling Co. 1 Dunn, western Caddo Parish wildcat near Greenwood, is planned soon. The test blew out and ran wild, making an estimated 25,000,000 cu. ft. of gas from what is believed to be the Ozan sand at 2,543-51 ft. The well has been successfully shut in with blowout preventer installed, and testing may be undertaken this coming week if recent rains and floods do not prevent it.

Operations Hampered

Heavy rains throughout the Ark-La-Tex area have caused shutdown on many drilling operations, and have prevented spudding of others. In the Joaquin field, Southern Production Co., Inc., has begun a drilling campaign with staking of two locations in western De Soto Parish. The two tests, drilled on unitized 160-acre tracts, are due to spud within a few days.

NORTH LOUISIANA COMPLETIONS

Bellevue—Bossier Parish

E. A. Jacobson 1 Hammett ..... SW NW SW 24-10-11
Dry, T.D. 762 ft.
Tide Water G. O. 2 Lodwick ..... NE SW 10-19-11
T.D. 416 ft., 8-in. casing 81 ft., 4-in. casing 405 ft., completed as injection well.

Sligo—Bossier Parish

Triangle Drlg. Co. 8-C Skannal ..... NE NE 13-17-12
50 bbl., 40 per cent salt water, ¼-in. choke, sand 2,990-3,010 ft., perf. 2,999-3,004 ft., deepened from 3,158 ft. to 3,146 ft.

Caddo—Caddo Parish

Gulf 12 Herndon ..... NW SE SE 15-21-15
Pumping 175 bbl., T.D. 1,663 ft., 4,000 gal. acid.
Texas Co. 12 Mabry ..... NE NE SE 15-21-15
Pumping 145 bbl. oil, 15 bbl. water, T.D. 1,644 ft., 4,000 gal. acid.

Urania—Grant Parish

R. D. Bevil 2 Swope ..... SE SE SE 18-9-1e
Pumping 25 bbl., top sand 1,601 ft., T.D. 1,604 ft., 6⅝-in. casing 1,588 ft.

Olla—La Salle Parish

Ark. Fuel Oil Co. 1-B Cruse ..... SE SW 19-10-3e
120 bbl., 3 per cent salt water, ⅜-in. choke, T.P. 70 lb., C.P. 360 lb., perf. upper Central sand 2,186-95 ft., T.D. 2,220 ft., 7-in. casing 2,220 ft.

Nebo—La Salle Parish

H. L. Hunt 5-A Goodpine ..... NW SW 9-7-3e
280 bbl., 4 per cent salt water, ⅛-in. choke, T.P. 1,075 lb., C.P. 1,425 lb., perf. 3,490-96 ft., 7-in. casing 3,875 ft., T.D. 3,880 ft.

NORTH LOUISIANA DRILLING REPORT

Bossier Parish

Roy L. Reese et al 1 Bellevue Land Co. ..... SW SW NE 27-20-11
T.D. 3,035 ft., old well drilled deeper, S.D.

Caddo Parish

Delta Drilling Co. 1 Dunn ..... NW NE NW 24-17-16
Wild gas well S.I., T.D. 2,551 ft., top Nacatoch 970 ft., top Annona 1,550 ft., preparing to test.
W. G. Ray Drlg. Co. 1 Noel Est. ..... C SE 30-21-14
Set 13⅜-in. casing 425 ft., drilling 2,405 ft.

Caldwell Parish

Gholson & Hodge 1 La. Central ..... NW NE 35-12-3e
T.D. 310 ft., S.D., high water.

Claiborne Parish

J. D. Caruthers, Tr., 1 Simmons unit .. N½ SW 2-20-5w
Deep Lisbon, coring 8,865 ft.
V. A. Hardin et al 1 Valentine ... NW NW 31-20-6w
S.D. 6,507 ft., 5½-in. casing 6,430 ft.
Union Prod. Co. 1-A Meadows et al ..... NE 18-21-4
Drilling sand 9,943 ft.

De Soto Parish

J. E. Stack et al 1 Cook ..... NW NE 32-13-14
S.D. 660 ft.

Franklin Parish

H. L. Hunt 3 Chicago Mill & Lbr. Co. .... SW SE 35-14-9e
Drilling shale and chalk 5,265 ft.

Grant Parish

Gholson & Hodge 1 Eberlee ..... NE NE 16-7-1e
10¾-in. casing 295 ft., coring sandy shale 3,355 ft.

La Salle Parish

Delta Drlg. Co. 1 Hughes ..... NE NE SW 22-8-1e
T.D. 4,000 ft., S.D., high water.
Hunter Co. 1 Pipes ..... SW SE 18-8n-3e
Moving in material.
Sinclair Prairie 1 Goodpine ..... NW SW 28-9-3e
First report.

Natchitoches Parish

Research Drlg. Co. 1 Walker ..... NE NE 9-10-10
Old well drilled deeper from 2,018 ft., drilling shale 2,600 ft.
J. E. Watts 1 Tanner ..... SW SW NW 18-10-10
T.D. 3,240 ft., reported 20 ft. in sand, 5½-in. casing 3,220 ft.

Red River Parish

Thornton & LaCroix 1 Prudential Life Ins. Co. .... SW SW NW 31-11-9
Set 5½-in. casing 1,195 ft., tested hole full salt water, show oil, T.D. 1,317 ft.

Sabine Parish

Roy Raines 1 Carter ..... SW NW NW 27-9-11
6⅝-in. casing 2,025 ft.
J. E. Watts 1 Cook Land Co. .... W½ SW NE 27-10-11
Rigging up.

Webster Parish

H. L. Hunt 1 Pardee ..... SW SE 36-22-10
T.D. 6,104 ft., S.D., salt-water sand 5,845-70 ft., Travis Peak 5,815 ft.

AVERAGE DAILY PRODUCTION
NORTH LOUISIANA

	Nov. 30	Nov. 23
Caddo light	5,950	5,740
Caddo heavy	2,240	2,210
Cotton Valley	*13,235	†13,250
Cross Lake	3,210	3,210
De Soto and Red River	1,025	1,010
Haynesville	2,665	2,650
Homer	2,775	2,800
Lisbon	3,040	3,090
Olla	7,260	7,000
Rodessa	16,605	16,925
Sligo	1,670	2,275
Urania	2,325	2,360
Zwolle	1,460	1,425
North Louisiana	63,460	63,945
Rodessa (Texas)	14,155	12,685

SOUTH ARKANSAS

Atlanta	2,475	2,450
Buckner	2,025	2,200
Champagnolle	1,130	1,150
Dorcheat	1,350	1,125
El Dorado	1,640	1,630
Magnolia	19,650	19,600
Rodessa	1,700	1,725
Schuler	16,600	16,950
Smackover light	1,600	1,605
Smackover heavy	13,575	13,500
Troy	1,125	1,165
Urbana	1,800	1,740
Arkansas	64,670	64,840

*3,590 bbl. is distillate. †3,600 bbl. is distillate.

ARKANSAS

Shallow wildcats in Clark County continue to report slight shows of oil. Coker Oil Corp. 1 Guess, 2-11-20, pumped for 2 hours at the rate of 25 bbl. daily, and a slight rainbow of oil appeared on the pits. It is now shut down for engine repair. To the north in the same section the Coker & Grieves 1 Sullivan encountered 4 in. of slightly porous saturated sand with a fair odor and stain between 606-07 ft. and is shut down after coring further to 619 ft. Two other wildcats are drilling in the immediate vicinity, but are now shut down because of high water.

ARKANSAS COMPLETIONS

Lewisville—Lafayette County

A. H. Boswell et al 2 C. H. Ellis .... NE SW NE 19-16-23
Location abandoned.

Troy—Nevada County

Berry Asphalt Co. 6 C. C. Fincher . NE NE SE 10-14-20
Pumping 18 bbl. oil, 2 bbl. salt water, T.D. 1,263 ft., 7-in. casing 1,254 ft.

Nick Springs—Union County

Delta Drlg. Co. 4 Grace ..... NW SE SE 31-17-14
260 bbl., ¼-in. choke, T.P. 570 lb., C.P. 1,300 lb., T.D. 3,708 ft., 5½-in. casing 3,707 ft., perf. 3,694-3,707 ft.

Woodley—Union County

H. H. Grimes 3 J. Williams ..... NE NW SW 8-18-14
Pumping 20 bbl., 25 per cent salt water, T.D. 2,245 ft., 6⅝-in. casing 2,210 ft.

Urbana—Union County

Marine Oil Co. 7-B Thompson ..... SW SE SW 3-18-13
T.D. 3,538 ft., dry.

ARKANSAS DRILLING REPORT

Clark County

Coker Oil Corp. 1 Guess ..... NE SE NE 2-11-20
T.D. 612 ft., pumped for 2 hr. at rate of 25 bbl., showed slight rainbow oil, S.D., engine repair.
Coker & Grieves 1 E. S. Sullivan .... SW NE NE 2-11-20
Set 8¼-in. casing 30 ft., top cap rock 603 ft., cored 603-07 ft., recovered 3 ft. 8 in., 4 in. slightly porous saturated sand, fair stain and odor, 3 ft. 4 in. hard tight conglomerate, cored 607-19 ft., recovered 11 ft. hard tight conglomerate, S.D. 619 ft.
W. S. King 1 McKenzie ..... SE SE NW 30-10-19
Set 10-in. casing 40 ft., S.D. 240 ft.
W. P. Wilson 1 Hamilton-Mathews .... SW NW 32-10-20
S.D., high water 1,572 ft.

(Continued on Page 75)

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LOUISIANA GULF COAST

West Bay and Bayou des Glaize Prospects Have Good Shows

By F. L. SINGLETON

NEW ORLEANS, La., Dec. 2.—Gulf 1 J. G. Timolat, a wildcat located on the West Bay prospect, Plaquemines Parish, was holding the attention of operators in the Louisiana Gulf Coast district as it drills ahead in shale below 6,470 ft. This well is running about 340 ft. structurally higher than the company's 1-E Buras Levee district, an abandoned well which was drilled in the area in 1939. An electrical survey is reported to have logged a sand section at 5,046-67 ft., with the top 8 ft. showing oil with 90 mv. porosity and 5 ohms resistivity on normal curve. Sidewall cores will be made of this interval when the next electrical survey is made. The area has been worked extensively with geophysical instruments and the well is located in 36-22s-30e.

Humble 3-B Wilberts, located on the Bayou des Glaize dome, Iberville Parish, is bottomed at 8,792 ft., and an electrical survey is being run after favorable showings were logged. Sandy shale and sand with an oil odor was cored at 8,260 ft., while 3 ft. of shale and sand with an oil odor was recovered in a core at 8,781-89 ft. Sandy shale and shale with an oil odor was logged at 8,789-92 ft. Bayou des Glaize is an old salt-dome structure which received its first production in April with the completion of the company's 2-B Wilberts which produced for several weeks from sand at 8,648-57 ft. However, the well was killed due to salt-water intrusion, and the well was later abandoned after several attempts to recomplete it failed. The present well is located northeast of 2-B Wilberts, and the hole is being drilled by directional methods.

Approximately 2 miles south of the Paradis field, St. Charles Parish, W. P. Luse and J. P. McAdams 1 Peyregne is preparing to drill ahead from a total depth of 10,042 ft., following an electrical survey which failed to record any showings of oil or gas. This well was reported to be checking favorably the previous week, but correlation with Texas 1 Paradis at 10,042 ft. shows the well to be running about 550 ft. low.

SUMMARY OF COMPLETIONS

Fields—	No.	Prod.	Footage
Oil wells	14	*5,006	100,255
Gas well	1	.....	4,395
Dry holes	5	.....	26,736
Total completions	20	.....	131,386

*Barrels.

Port Barre Test Under Control

McDannald Oil Co. 3 Futral, on the north flank of the Port Barre dome, St. Landry Parish which last week blew out and ran wild for several days, is now closed in, and the well is reported to have flowed an estimated 25,000 bbl. of oil while flowing wild. The well was drilled to a total depth of 5,658 ft., and was being completed through perforated casing at 5,648-58 ft. when the blowout occurred.

New Iowa Deep Sand

Gas production from a new and deeper sand, probably the Vicksburg formation, was indicated for the Iowa field, Calcasieu and Jefferson Davis parishes as Shell 32 Heyd flowed 1,300,000 cu. ft. of gas per day while testing through perforated casing at 8,758-63 ft. The perforations are being squeezed off and additional tests are expected to be made before plugging back and completing in the 8,200-ft. sand. In the meantime Shell 4 Fontenot topped sand showing oil at 8,104 ft. and is drilling deeper after logging the base of the sand section at 8,284 ft. Locations for two additional wells which will be drilled to the 8,200-ft. pay were announced by Stanolind Oil & Gas Co. In the Calcasieu Parish sector of the field, 1 Gillson is to be drilled as an offset to Magnolia 15 Wait in 12-9s-7w, while on the Jefferson Davis Parish side of the field 1 E. W. Willett was located in 7-9s-7w. Interest in the field is centered on S. W. Richardson 1 Sweet Lake Land Co., about 2,000 ft. south of production which is coring in shale below 7,898 ft., and the outcome of this well should be known by the first of the week.

South Crowley Field

Prospects of extending production in the South Crowley field, Acadia Parish, were not encouraging as Humble 1 T. B. Freeland, ½ mile south of production tested gas, and salt water when tested at 7,090-97 ft., and the well has been killed preparatory to retesting. This well was drilled to a total depth of 9,029 ft., and only slight showings were encountered in the two sand sections which so far have proven to be very erratic.

An excellent producer was recorded for the Woodlawn field, Jefferson Davis Parish, with the completion of Union Sulphur Co. 1 F. Romero which flowed 565 bbl. per day through a 14/64-in. choke from perforated casing at 9,540-43 ft. The well is located in 1-9s-6w.

Bayou Blue Extension

Production on the north flank of the Bayou Blue field, Iberville Parish, was extended several hundred feet north by the completion of Superior 6 Schwing Shingle & Lumber Co. which flowed 195 bbl. per day through an 8/64-in. choke. The well was drilled to a total depth of 6,448 ft., and was completed through perforated casing at 5,778-82 ft.

Titantic Oil Co. 1 Marrero, a prospective pool opener located in the Westwego area, Jefferson Parish, is drilling in shale in a sidetracked hole at 6,455 ft., after plugging back and sidetracking below 3,500 ft. This well blew out from a depth below 9,900 ft. 3 weeks ago which caused the drill stem to stick, and after several attempts to recover same failed, the company decided to redrill a new hole.

In the Bayou Pigeon field, Iberia Parish, Plymouth 1 State, 24-12s-10e, recovered salt water with a slight show of oil when tested through perforated casing at 8,055-63 ft., and the company is preparing to retest after squeezing off perforations and retesting at a higher level. The well is bottomed at 8,140 ft., and 7-in. casing was cemented at 8,122 ft. This is the third well to be drilled on the structure.

LOUISIANA GULF COAST COMPLETIONS

Ascension Parish

Darrow field: Humble 32 Community, 220 bbl., 12/64-in. choke, top sand 4,680 ft., T.D. 4,693 ft.

Assumption Parish

Wildcat: Humble 1 Michie, dry, T.D. 9,531 ft.

Calcasieu Parish

Iowa field: Magnolia 15 Wait, 840 bbl., ¼-in. choke, perf. casing 8,225-35 ft., T.D. 8,234 ft.
A. C. Glassell 1 Bowman, dry, T.D. 9,287 ft.

Cameron Parish

East Hackberry field: Texas 31 State, dry, T.D. 5,790 ft.
West Hackberry field: Superior 5 Vincent, 352 bbl., 12/64-in. choke, perf. casing 7,927-59 ft. and 6,978-8,014 ft., T.D. 8,520 ft.

East Baton Rouge Parish

University field: William Helis 5-C Duplantier, gas well, perf. casing 4,344-56 ft., T.D. 4,395 ft.

Evangeline Parish

Ville Platte field: Amerada 2 Foret, 386 bbl., ¼-in. choke, perf. casing 10,124-42 ft., T.D. 10,195 ft.
Continental 1 Ed Tate, 67 bbl., ⅞-in. choke, perf. casing 8,835-95 ft., T.D. 10,080 ft.

Iberia Parish

Fausse Point field: Texas 8 State, 523 bbl., ¼-in. choke, perf. casing 7,675-95 ft., T.D. 7,945 ft.

Iberville Parish

Bayou Blue field: Superior, 199 bbl., 8/64-in. choke, perf. casing 5,763-82 ft., T.D. 6,448 ft.
Choctaw field: Louark Prod. Co. 13 Wilberts, 349 bbl., ¼-in. choke, perf. casing 3,735-55 ft., T.D. 4,197 ft.
White Castle field: Shell 18 Wilberts & Son, 456 bbl., ¼-in. choke, perf. casing 6,655-75 ft., T.D. 7,000 ft.

Plaquemines Parish

Garden Island field: Texas 49 State, 176 bbl., ½-in. choke, sand 4,540-70 ft. and 4,705-30 ft., T.D. 5,520 ft.

Grand Bay field: Gulf 5 State, 515 bbl., 7/64-in. choke, perf. casing 8,745-68 ft., T.D. 8,770 ft.
Potash field: Humble 47 Orleans Levee Board, 640 bbl., ¼-in. choke, T.D. 8,030 ft.

Rapides Parish

Cheneyville field: Amerada 15 Well, 240 bbl., 7/64-in. choke, perf. casing 5,685-96 ft., T.D. 5,699 ft.

St. Martin Parish

Bayou Bouillon field: Superior 3 Rycade, 43 bbl., pumping, perf. casing 3,305-14 ft., T.D. 4,924 ft.

St. Mary Parish

Charenton field: Failing Exploration 4 Viguerie, dry, T.D. 1,180 ft.
Failing Exploration 4 Giles-Viguerie, dry, T.D. 948 ft.

LOUISIANA GULF COAST DRILLING REPORT

Acadia Parish

Herton Oil Co. 1-A Leonard, 29-7s-1e, drilling shale 9,342 ft.
H. M. Naylor 1 Medlenka, Mermentau area, 33-9s-2w, drilling shale 7,393 ft.

Cameron Parish

Lisbon-Iberia 1 Calcasieu National Bank, 19-12s-4w, S.D. 2,219 ft.
Superior 4 State, Lake Calcasieu, drilling shale 7,966 ft.

Iberia Parish

Frank Bennett 1 Gabriel Darby, 56-11s-6e, drilling shale 2,250 ft.

East Baton Rouge Parish

H. C. Cockburn 1 Gianellon, 58-8s-1e, drilling 6,125 ft.

St. Bernard Parish

California Co. et al 1 Biloxi Marsh Lands Co., 25-12s-16e, drilling shale 1,876 ft.

St. Tammany Parish

W. T. Burton 1 State-Lake Ponchartrain, 10¾-in. casing 200 ft., waiting on cement.

Terrebonne Parish

Barnsdall 2 Nelson Development Co., Au Fer prospect, 3-21s-11e. drilling shale 10,560 ft.

North Louisiana-Arkansas

(Continued from Page 73)

Dallas County

H. H. McBride et al 1 Southern Kraft Corp. ..... SE SW 16-9-16
S.D. 1,463 ft.

Hempstead County

S. H. Cadenhead et al 1 J. J. Bruce ... SE SE 27-10-24
S.D. 206 ft.

Lonoke County

Lunnon, Howell & Ford 1 City of Cabot ..... Lot 1, Blk. 6, 18-4n-9w
Drilling 1,371 ft.

Prairie County

Hazen Oil Co. 1 Fidelity Mutual Life Ins. Co. ..... NE NE SW 16-2n-6w
S.D. 340 ft.

Saline County

A. W. Givens 1 Williams ..... NW NE NE 18-3s-15w
T.D. 690 ft., hole clean, arranging to deepen.
Tedford Drlg. Co. 1 Williams 31-3s-15w
S.D. 571 ft.

St. Francis County

U. S. Oil Corp. 1 Wilford ..... NE SE NE 29-4n-1w
S.D. 930 ft.

Union County

C. H. Murphy, Jr., 2-B Cates et al ..... S½ NW NW 33-18-15
T.D. 2,125 ft., set 7-in. casing 2,125 ft.

Woodruff County

John N. Watkins 1 S. Nathan .... NE NE SW 18-5n-2w
Set 8¼-in. casing 325 ft.

EAST TEXAS BORDER

Paluxy gas was discovered in Shelby County last week by the Superior Oil Co. 4 Pickering Lumber Co., a deepened test in the W. J. Crane Survey. The first Paluxy sand was cored at 3,678 ft. and a drill-stem test at 3,678-85 ft., using ⅝-in. choke at top and ¼-in. choke at bottom, showed a working pressure of 50 lb., 30 ft. of drilling mud and an estimated 1,000,000 cu. ft. of gas in 10 minutes. The test is drilling ahead below 4,600 ft.

EAST TEXAS BORDER COMPLETIONS

Wildcat—Bowie County

Lee Timberlake et al 1 Smith, T. H. Hill Sur., T.D. 3,035 ft., dry.

Texas Had Commercial Oil in 1878

A few weeks ago a plaque was presented and a monument erected in Corsicana, Tex., to commemorate the discovery of oil in commercial quantities in Texas in 1895. This was the first commercial oil in Texas as it is known today; however, an early settler in Brownwood recalls two commercial uses for their oil several years prior to the Corsicana discovery. According to affidavits made several years ago by two Brownwood citizens, one Martin Meichinger, who operated a wagon yard where a 12-story building now stands, found oil at 102 ft. while digging a water well. The well produced about 5 bbl. of dark, low-gravity oil per day. It was sold for lubricating wagon wheels at 50 cents per gallon and for medicinal purposes at 25 cents for a 4-oz. bottle. In later years more than 100 wells were drilled southwest of this old producer.

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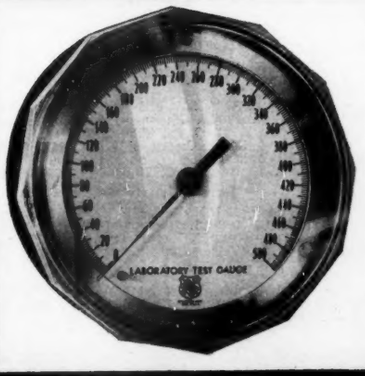

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By

STAFF CORRESPONDENT

Indications of New Fields in Hamilton and Jefferson

MATTOON, Ill., Dec. 2.—Activity in Illinois continued to decline this week as 47 oil wells and 15 dry holes were completed. The initial production of the completed producers was unusually high, the total for the 47 wells being 13,359 bbl., or 284 bbl. per well. Louden field recorded four completed producers with an initial production of 349 bbl., while activity in White County showed a slight rise with the completion of 15 producers and 3 dry holes. Production in White County was above normal with a reported initial production of 3,095 bbl., an average of 206 bbl. per well. Of the 18 completions, 9 were in the East Calvin pool. Activity in the Centralia pool of Clinton County showed a marked increase as five oil wells were completed for 5,521 bbl., or 1,104 bbl. per well. The remaining completions were in various scattered counties of the basin area, and included 23 producers with an initial production of 4,394 bbl.

W. C. McBride obtained the largest producer of several weeks with the completion of 9 Carson, in E½ NE SE 35-2n-1w, Centralia field. This well flowed 3,765 bbl. in 6 hours after an acid treatment of 5,000 gal. in Devonian at 2,898 ft.

Kentucky Natural Gas et al 4 Bierhaus, a gasser being drilled in S½ NW SE 13-4n-11w, Lawrence County, blew out of control at 823 ft. This well produced 7,000,000 cu. ft. of gas at 815 ft., and 30,000,000 cu. ft. of gas at 820 ft. before blowing out. The well is now in the Bridgeport, but will be deepened to the Buchannan as soon as the hole can be opened.

SUMMARY OF COMPLETIONS

Fields—	No.	Prod.	Footage
Oil wells	44	*12,385	107,336
Dry holes	5	.....	11,920
Wildcats—			
Oil wells	1	*3	1,019
Dry holes	19	.....	21,658
Total completions	61	.....	141,733
Recompletions	2	*946	.....

*Barrels.

AVERAGE DAILY PRODUCTION

Salem	120,970
Louden	70,760
Centralia	15,850
Other basin fields	112,270
Old fields	11,120
Illinois	330,970

Hamilton County Discovery

A new pool in Hamilton County was opened this week with the near completion of Kingwood 1 Prince, in NW SW NW 31-5s-7e, which swabbed and flowed 415 bbl. of which 6 per cent was acid water. The well is a mile north of the Dale pool and a mile east of the Hoodville pool, but is producing from the McClosky at a total depth of 3,256 ft., while the Dale field produces from the Cypress and the Hoodville from the Benoist. The showing of 1 Prince was unexpected as the well was recovering only small amounts of oil in swabbing tests prior to acid treatment.

Kingwood Oil Co. has discovered both of the county's two fields, one at Hoodville and the other at Dale. In addition it is now completing a wildcat in the northern part of the county as a prospective pool opener. This well, 1 Williams, in S½ SE NE 3-4s-6e, is making approximately 56 bbl. of oil and 130 bbl. of water daily from the McClosky.

Jefferson County

A new pool was assured in Jefferson County when Obering and Phillips 1 Howe, NW SW SW 25-2s-1e, swabbed 4½ bbl. of oil an hour from the Benoist 1,981-88 ft. This well will probably be completed as about a 100-bbl. well. It is 2½ miles from the nearest production in the small Roaches field.

The test is a farmout from Shell Oil Co., Inc., which has leases offsetting the discovery on three sides.

ILLINOIS COMPLETIONS

Bond County

Wildcat: Spindler Inv. 1 fee, NW NW NE NW 16-6n-2w, pumped 3 bbl. oil and 1 bbl. water, 40-qt. shot, Benoist 1,007 ft., T.D. 1,019 ft., 1 ml. NW of Womack pool.

Clinton County

Centralia pool: Morgan 4 Allison, NE SW SW 35-2n-1w, pumped 47 bbl., 20-qt. shot 1,370-75 ft., Benoist 1,365 ft., T.D. 1,375 ft.

Adams 25 Copple, SE SE SW 35-2n-1w, pumped 39 bbl., Benoist 1,357-67 ft., T.D. 1,367 ft.

W. C. McBride 9 Carson, E½ NE SE 35-2n-1w, flowed 3,765 bbl. in 6 hr., 5,000 gal. acid, Devonian 2,856 ft., pay 2,898 ft., T.D. 2,912 ft.

Hawley Oil 2 White, SE SE SW 12-1n-1w, flowed 913 bbl. through 1-in. choke, 2,000 gal. acid, pay 2,929 ft., T.D. 2,937 ft.

T. E. Yemm 3 Allison, NE NW SE 12-1n-1w, flowed 796 bbl., 2,000 gal. acid, Devonian 2,867 ft., pay 2,912 ft., T.D. 2,918 ft.

Clay County

Wildcat: Dee Miller 1 Smith, NE SW SW 15-3n-7e, dry, Golconda 2,503 ft., Cypress 2,607 ft., Paint Creek 2,750 ft., Benoist 2,785 ft., Benoist sand 2,790 ft., Renault 2,846 ft., Ste. Genevieve 2,912 ft., Rosiclare 2,922 ft., Fredonia 2,952 ft., St. Louis 3,024 ft., no shows, T.D. 3,033 ft.

Edwards County

Albion pool: I. G. Watkins 2 Conover, NE SE SW 13-2s-10e, pumped 5 bbl. oil and 10 bbl. water, 15 and 30-qt. shots 1,578-96 ft., Bridgeport 1,576 ft.

I. G. Watkins 1 Conover, NE SE SW 13-2s-10e, dry, 30-qt. shot McClosky 3,157-68 ft., tested water, T.D. 3,260 ft.

Superior 2 Fewkes, NE NW NW 18-2s-11e, pumped 84 bbl., 7 per cent acid water, 3,000 gal. acid, McClosky 2,324-34 ft., T.D. 3,190 ft.

Franklin County

Thompsonville pool: Benedum-Trees 4 Chenault, SW SE SE 27-7s-4e, pumped 220 bbl., 1,000 gal. acid, McClosky 3,149-58 ft., T.D. 3,158 ft.

Langenfelt et al 1 Sanders, NW NE NW 35-7s-4e, pumped 50 bbl., 5-qt. shot 3,079-84 ft., pay 3,079-82 ft., T.D. 3,156 ft., P.B. to 3,084 ft.

Fayette County

Louden pool: Carter 4 A. W. St. Pierre, SW SW NE 1-8n-3e, pumped 96 bbl., 30-qt. 1,523-37 ft., Cypress sand 1,512-37 ft., T.D. 1,537 ft.

Carter 7 G. R. Owen, NE NE NW 17-7n-3e, pumped 48 bbl., 10-qt. shot 1,518-21 ft., Cypress sand 1,496-1,550 ft., Paint Creek sand 1,574-86 ft., T.D. 1,586 ft., P.B. to 1,525 ft.

Magnolia 25 T. C. Clow, NE SE NE 5-7n-3e, flowed 180 bbl., 10-qt. shot 1,471-81 ft., 60-ft. shot 1,521-52 ft., Cypress sand 1,464-70 ft., 1,479-87 ft., Paint Creek 1,512-19 ft., T.D. 1,553 ft.

Texas 14 A. H. Yakel, SE NW SE 6-6n-3e, pumped 25 bbl., Cypress 1,548 ft., Cypress sand 1,581 ft., T.D. 1,586 ft.

St. James pool: D. B. Lesh 1 H. Haynes, SE NW SW 35-6n-2e, dry, Palestine 1,260 ft., Menard 1,400 ft., Tar Springs 1,510 ft., sand 1,564-1,600 ft., T.D. 1,665 ft.

Hamilton County

Hoodville pool: Shell 2 N. Porter, NE SW SE 34-5s-6e, pumped 298 bbl., 10-qt. shot, Benoist 2,926-51 ft., T.D. 2,960 ft.

Ohio 1 R. E. Grimes, NW NW NW 2-6s-6e, pumped 105 bbl., natural, Paint Creek 2,865 ft., Benoist 2,935 ft., T.D. 2,951 ft.

Dale pool: Texas 3 M. Davis, SW NW NE 7-6s-7e, pumped 5 bbl., pumped off in 6 hr., 5-qt. shot 2,660-65 ft., Cypress sand 2,653-65 ft., T.D. 2,670 ft.

Wildcat: Wood River Devel. 1 Walker, SW NE NW 26-4s-7e, dry, Glen Dean 2,692 ft., Cypress 2,954 ft., Cypress sand 2,970 ft., Paint Creek 3,127 ft., Benoist 3,136 ft., Aux Vases 3,269 ft., Ste. Genevieve 3,302 ft., Fredonia 3,351 ft., T.D. 3,513 ft.

Jasper County

North Boos pool: Pure 3 Ed Waggoner-A, E½ NE NE 17-6n-10e, flowed 237 bbl., 5,000 gal. acid, Fredonia 2,781 ft., pay 2,783-87 ft., T.D. 2,800 ft.

West Liberty pool: Pure 1 Dickerson-Harvey Consol., E½ NW NW 17-5n-10e, flowed 1,058 bbl., 5,000 gal. acid, pay 2,799-2,802 ft., 2,805-10 ft., T.D. 2,820 ft.

Pure 1 R. Shinn, W½ SW NE 8-5n-10e, pumped 182 bbl., 5,000 gal. acid, 5,000 gal. reacid, Fredonia 2,786 ft., pay 2,792-97 ft., T.D. 2,813 ft.

M. P. Schiek 1 Payne heirs, S½ NE NE 5-5n-10e, flowed 789 bbl., 51/64-in. choke, 5,000 gal. acid, Fredonia 2,770 ft., pay 2,770-73 ft., 2,792-93 ft.

Jersey County

Wildcat: Hughes Pet. 1 Kallail, SE SE NW 22-8n-12w, dry, Osage 61 ft., Chattanooga 430 ft., Devonian 465 ft., Maquoketa 595 ft., Trenton 675 ft., St. Peter 1,148 ft., T.D. 1,220 ft.

Lawrence County

Bridgeport pool: Robinson et al 1 Warren, NW NW NE 29-3n-12w, pumped 10 bbl., 20-qt. shot 1,880-96 ft., Benoist 1,876 ft., T.D. 1,898 ft.

Macoupin County

Carlinville pool: O. Z. Smith 1 Klein, NW NE SE 7-9n-7w, dry, Devonian 1,295 ft., T.D. 1,380 ft.

Marion County

Salem pool: Texas 10 F. Shanafelt, NW NW NE 16-2n-2e, pumped 124 bbl., 20-qt. shot 1,870-90 ft., Benoist 1,855 ft., T.D.

Wildcat: Texas 2 P. B. Chance, N½ NE SE 5-2n-2e, dry, Ste. Genevieve 2,108 ft., Rosiclare 2,126 ft., Fredonia 2,151 ft., McClosky 2,167-70 ft., St. Louis 2,288 ft., T.D. 2,296 ft.

Montgomery County

Wildcat: J. E. Hood 1 Dambacher, SE NE SE 16-12n-5w, dry, Potter 625 ft., T.D. 645 ft.

L. C. Kessler 1 A. Nowak-A, SE NE NW 11-7n-4w, dry, Benoist 894 ft., no shows, T.D. 907 ft.

St. Clair County

Dupo pool: W. W. Strickler 3 P. Frye, SW NE NE 33-1n-10w, pumped 180 bbl. oil and 600 bbl. water, 1,000 gal. acid, 60-qt. shot 700-47 ft., Trenton 685 ft., T.D. 747 ft.

C. S. Wise 2 Tarlton, NW NW NE NE 33-1n-10w, pumped 105 bbl. oil and 4,000 bbl. water, 1,000 gal. acid, Trenton 633 ft., T.D. 695 ft.

Tarlton 4 fee, N½ SE SE 28-1n-10w, pumped 25 bbl. oil and 35 bbl. water, 1,000 gal. acid, Trenton 490 ft., T.D. 538 ft.

Wildcat: Harris et al 1 City Park, NW SE 34-2n-9w, dry, T.D. 1,629 ft.

Wabash County

North Griffin pool: C. E. Skiler 2 Elkins, SW SW NW NE 29-2s-13w, old well P.B., old T.D. 2,512 ft., P.B. to 1,769 ft., pumped 50 bbl., 10 and 20-qt. shots, Biehl 1,744-69 ft.

Lancaster pool: Snowden-McSweeney 3 Seibert, SE NE NW 34-2n-13w, dry, Paint Creek 2,426 ft., Renault 2,497 ft., Ste. Genevieve 2,558 ft., Rosiclare 2,580 ft., Fredonia 2,598 ft., T.D. 2,666 ft.

Mount Carmel pool: R. O'Meara 1 Felty, NE NW SE 17-1s-12w, pumped 75 bbl., 20-qt. shot 2,037-54 ft., Cypress sand 2,037-54 ft., T.D. 2,057 ft., P.B. to 2,050 ft.

Keensburg pool: Tide Water 4 Bucholz, NW SE NE 9-2s-13w, pumped 100 bbl., 10-qt. shot 2,420-24 ft., Cypress sand 2,406-27 ft., T.D. 2,455 ft., P.B. to 2,425 ft.

Washington County

Irvington pool: Mudge Oil 1 W. E. Brown, W½ NE SW 23-1s-1w, flowed 229 bbl., 2,500 gal. acid, Devonian 3,081 ft., T.D. 3,140 ft.

Wayne County

Enterprise pool: Pure 3 Gid Miller-B, N½ SE SW 5-1n-8e, pumped 238 bbl., 5,000 gal. acid, pay 3,032-43 ft., T.D. 3,095 ft.

Pure 3 C. Bates-A, S½ NE NE 8-1n-8e, pumped 252 bbl., 5,000 gal. acid, pay 3,033-37 ft., show of oil 3,085-89 ft., T.D. 3,100 ft.

White County

Rebeyre Island pool: Superior 4 Greathouse, NE NW NE 4-5s-14w, pumped 85 bbl., perf. 2,688-98 ft., 2,716-26 ft. in Bethel, 2,838-48 ft. in Aux Vases, T.D. 2,903 ft.

Superior 2 Greathouse, NE SW NE 4-5s-14w, pumped 58 bbl., perf. 2,709-25 ft. in Bethel, T.D. 2,929 ft.

Sun 8 Greathouse, SW SE SE 33-4s-14w, old well P.B., old T.D. 2,900 ft., P.B. to 2,710 ft., perf. 2,680-2,710 ft., 60-qt. shot 2,680-2,710 ft., flowed 1,050 bbl.

Superior 5 Given, SW SW NW 34-4s-14w, flowed 105 bbl., 3,000 gal. acid, Benoist 2,690-2,730 ft., T.D. 2,730 ft.

East Calvin pool: Arrow Drlg. and Walker 1 F. M. Hon-D, NE SW SW 33-3s-14w, pumped 110 bbl., perf. 2,438-52 ft., Cypress sand 2,438-52 ft., 2,599-2,604 ft., 2,605-17 ft., T.D. 2,617 ft.

Herndon Drlg. 5 J. J. Bond, SW SW NE 8-4s-14w, flowed 140 bbl., 80-qt. shot 2,678-2,710 ft., Paint Creek 2,659-67 ft. and 2,670-90 ft., Benoist 2,696-2,705 ft., T.D. 2,712 ft.

Pure 9 Potter, SE NW SW 9-4s-14w, pumped 168 bbl., natural, Aux Vases 2,811-42 ft., T.D. 2,842 ft.

Cherry & Kidd 4 W. W. Gray-B, NE NE NE 17-4s-14w, pumped 150 bbl., 40-qt. shot 2,823-50 ft., Aux Vases 2,763-92 ft., 2,819-54 ft., T.D. 2,854 ft.

Cherry & Kidd 5 W. W. Gray-B, SW NE NE 17-4s-14w, pumped 140 bbl., Benoist 2,684-2,716 ft., T.D. 2,718 ft.

Cherry & Kidd 2 W. W. Gray-E, SE NE NW 17-4s-14w, pumped 105 bbl., 60-qt. shot, Benoist 2,695-2,707 ft., 2,714-22 ft., T.D. 2,722 ft.

W. W. Gray 1 fee, SE SW NE 17-4s-14w, pumped and flowed 243 bbl., 40-qt. shot, Benoist 2,681-2,708 ft., T.D. 2,708 ft.

Ryan Oil 2 Bramlett-B, SE NW SE 17-4s-14w, flowed 178 bbl., natural, Cypress 2,555-83 ft., saturated, Paint Creek 2,651 ft., T.D. 2,715 ft.

Ryan Oil 3 Bramlett-B, SE NW NE 17-4s-14w, flowed 288 bbl., Cypress sand 2,555 ft., pay 2,514-84 ft., T.D. 2,584 ft.

Cherry & Kidd 4 W. W. Gray-C, SE SW SE 8-4s-14w, location abandoned.

North New Harmony pool: Superior 6 H. C. Ford et al-C, SE NE SW 27-4s-14w, flowed 300 bbl., 3,000 gal. acid, McClosky 2,879-88 ft., T.D. 2,922 ft.

Superior 4 H. C. Ford-C, NE SE SE 27-4s-14w, dry, Menard 2,045 ft., Tar Springs sand 2,199-2,207 ft., Glen Dean 2,338 ft., Golconda 2,542-53 ft., Cypress sand 2,590-2,634 ft., Renault 2,754 ft., Aux Vases 2,812-31 ft., Ste. Genevieve 2,833 ft., McClosky 2,938-42 ft., T.D. 2,949 ft.

Stokes pool: Penn O. & G. 2 Uly Pyle, NE NE NE 12-6s-8e, pumped 35 bbl. oil and 60 bbl. water, 3,000 gal. acid, perf. 3,034-44 ft., pay 3,070-86 ft., 3,100-04 ft.

Wildcat: Noah & Morrison 1 Kershaw, SW NW NE 22-3s-10e, dry, Benoist 2,981 ft., Renault 3,024 ft., Aux Vases 3,101 ft., Aux Vases sand 3,104 ft., Ste. Genevieve 3,158 ft., McClosky 3,206-25 ft., 3,245-51 ft., St. Louis 3,275 ft., T.D. 3,283 ft., P.B. 2,937 ft.

Wickmire 1 Martin, W½ NW SW 7-6s-9e, dry, perf.

2,864-82 ft., swabbed 2 bbl. oil and 10 bbl. water per hr., old T.D. 3,160 ft.

Woodford County

Wildcat: Morton O. & G. 1 J. E. Roche, SW SW NE 18-25n-1e, dry, Kinderhook 858 ft., Devonian 1,055 ft., Trenton 1,683 ft., T.D. 1,770 ft.

ILLINOIS DRILLING REPORT

Bond County

J. B. Barnes 1 Watts.....NE SW NE 7-5n-2w
Ste. Genevieve 1,219 ft., drilling 1,275 ft.
J. Harding 1 Gottfried.....NE NW NE 28-5n-4w
Cypress, oil stain 735 ft., S.D. 929 ft.

Clark County

Wisconsin 1 Cunningham.....SW SW SW 34-12n-14w
Mississippian 334 ft., set 5-in. 334 ft., show oil 357 ft., S.D. 358 ft.

Clinton County

G. Borton et al 1 Storer.....SW NW NE 13-1n-1w
Pumped 80 bbl. in 9 hr., testing Trenton.
Williams & Lynn 1 Thomas est. SW NE NW 24-2n-1w
Drilling 500 ft.
J. F. Ashoff 1 Lampen.....NW NW NW 16-1n-2w
Location.
Nat. Consumers Oil 1 Fricke.....NW SE SW 14-1n-2w
Glen Dean 1,047 ft., S.D. 1,295 ft.

Coles County

F. H. Bragassa 1 Trogden.....E½ NE SE 11-11n-7e
Glen Dean 1,712 ft., Golconda 1,792 ft., Cypress 1,811 ft., Paint Creek 1,880 ft., slight show oil 1,872-80 ft., drilling 1,905 ft.

Douglas County

Pogue et al 1 Owens.....NW SW NW 26-15n-7e
Drilling 284 ft.

Edwards County

J. D. Barnes 1 Hodgson.....N½ NE 1-2s-10e
S.D. 2,350 ft.
R. Neeley 1 Michael.....NW SW NW 8-1s-10e
Drilling 2,535 ft.

Effingham County

C. L. Erwin 1 Patterson.....SW SW NE 18-8n-4e
S.D. 1,580 ft., may drill deeper to McClosky.
K. Kilpatrick 1 Mason Comm.....SE SE NW 2-6n-5e
Pumped 255 bbl., testing, may acidize.

Fayette County

Luttrell et al 1 Bail.....NE SW SE 16-7n-3e
Set 4½-in. 1,563 ft., waiting on cement.
Turner Drlg. 1 Williams.....SW SW NW 6-6n-2e
Spudded and S.D.
Kingwood 1 Aukamp.....SW SE 30-5n-3e
Drilling 2,822 ft.
Kingwood 1 Dayton.....E½ NW SE 14-6n-1w
Location.

Ford County

Nelson et al 1 Erp.....SW NW SE 19-24n-7e
Underreaming 5-in. at 2,390 ft.

Franklin County

G. Venorsky 1 L. Austin.....W½ SE SW 22-7s-4e
S.D. 3,202 ft.
Helmerich & Payne 1 P. M. Marvel NW NW SW 36-7s-4e
P.B. 2,675 ft., 7-in. 2,653 ft., drilled plug, tested water, P.B. 2,670 ft., S.D.
E. S. Adkins 1 Orient Coal Co. NE SW SE 24-6s-2w
S.D. 2,150 ft.

Gallatin County

Carter 1 B. M. York.....SE SE SW 33-7s-8e
7-in. 2,110 ft., P.B. 1,722 ft., swabbed 50 bbl. in 12 hr., 3 per cent b.s. and w., Palestine, to shoot.
Snowden & McSweeney 1 Frey....SE SE NW 19-8s-10e
S.D. 2,781 ft., McClosky.

Greene County

Brainerd 1 Bollman.....NE NE SW 2-12n-13w
Set 10-in. 40 ft., 8-in. 170 ft., 7-in. 580 ft., Trenton 580 ft., drilling 595 ft.

Hamilton County

Kingwood 1 McGuire.....W½ SW NW 11-5s-7e
Kinderhook 2,289 ft., Menard 2,548 ft., Waltersburg 2,629 ft., Glen Dean 2,770 ft., Barlow 3,035 ft., Cypress 3,043 ft., Cypress sand 3,099 ft., Paint Creek 3,181 ft., Benoist 3,207 ft., drilling 3,375 ft.

Hancock County

Sam Tate et al 1 J. Rice.....SW NE NW 28-4n-5w
Drilling 1,480 ft.

Jackson County

Barton & Shipman 1 P. Maharry..NE NE SE 20-9s-3w
Drilling 315 ft.

Jasper County

Anderson & Vorhees 1 A. Pippen SE NW SW 16-8n-10e
Swabbing and testing McClosky, T.D. 2,600 ft.

Jefferson County

Obering & Phillips 1 A. F. Howe NE SW SW 25-2s-1e
Benoist 1,974 ft., pay 1,981-88 ft. (saturated), 4½-in. 1,977 ft., drilled plug, filled up 300 ft. oil in 1 hr., testing.
Vawter 1 Modglin.....NW SE SW 9-1s-1e
Drilling 1,610 ft.

Lawrence County

Robinson 1 Sauers.....NW SE NW 20-3n-12w
Drilling 3,847 ft.
W. Payne 1 H. Payne.....NW SW NW 20-3n-11w
Fishing 698 ft.
Ky. Nat. Gas et al 4 Bierhaus..S½ NW SE 13-4n-11w
Bridgeport 779 ft., 7,000,000 cu. ft. gas 815 ft., 30,000,000 cu. ft. gas 820 ft., blew out of control at 823 ft., S.I.
W. Kays 1 Griggs.....SW SW SE 12-3n-13w
S.D. 305 ft.

Madison County

F. C. Kiskadden 1 G. A. Fisher..SE SW NE 27-5n-8w
S.D. 190 ft.

Marion County

Martin et al 1 Robinson.....SW SE SW 4-2n-1e
Trenton 4,268 ft., drilling 4,554 ft.
Paul Rossi 8 Brooks.....SW NE SW 29-2n-2e
Drilling 3,590 ft.
Clevetex Prod. 1 E. Squibb.....W½ SE SE 29-3n-3e
S.D. 2,500 ft.

Macoupin County

Bridges & Valbert 1 Felker.....NW NE SW 1-9n-7w
S.D. 670 ft.
F. Midgett 1 Dorks.....NE NE NE 30-10n-7w
7-in. 400 ft., underreaming.

McDonough County

Bancroft & Bowman 1 W. A. Murray.....
NW SE SE 8-5n-4w
Drilling 385 ft.
Ripley Drlg. Co. 1 T. A. Jeffries NW NE SW 21-4n-4w
S.D. 400 ft.

McLean County

Funksgrove O. & G. 1 Crawford NW NW NW 28-22n-1e
Set 14-in. at 364 ft., drilling 445 ft.

Montgomery County

H. C. Detrick 1 W. H. Barnes NW NE SE 20-10n-2w
Lost hole at 1,010 ft., to skid.
W. L. Topf 1 Fisher.....NE NE SW 19-9n-3w
7-in. 165 ft., waiting on cement.
H. Greene 1 Blackburn.....SW SE NE 7-7n-2w
Drilling 1,342 ft.
Ginsberg et al 1 McDenver.....SW NE SE 14-7n-2w
Moving in machine.

Pope County

Ohio 1 Gen. Amer. Life.....NE SE SE 10-11s-5e
Ste. Genevieve 1,359 ft., Rosiclare 1,384 ft., Fredonia 1,438 ft., drilling 1,589 ft.

Randolph County

Fisher 1 Utchman.....SW SW NE NW 7-6s-5w
St. Louis 1,185 ft., S.D. 1,902 ft.

J. R. Rankin 1 B. Bierman.....SW SW SE 3-7s-5w
S.D. 380 ft.

St. Clair County

B. W. Fitzgerald 1 Ittner.....SE SW SE 9-1n-8w
Moving in machine.

Shelby County

J. Moore et al 1 fee.....SW SW NE 30-10n-3e
Drilling 678 ft.

Tazewell County

Bartelmay 1 Mathis.....SW NW SW 24-25n-3w
Running casing 403 ft.

Wabash County

C. A. Evarts 1 Hahn.....NW SE NW 8-1n-12w
S.D. 1,107 ft.
Ryan 1 Schafer.....NE NW NE 7-25-13w
Menard 2,000 ft., Glen Dean 2,255 ft. (?), drilling 2,310 ft.
De Kalb et al 3 Hunleth.....SW NE NW 29-3s-14w
Drilling 695 ft.

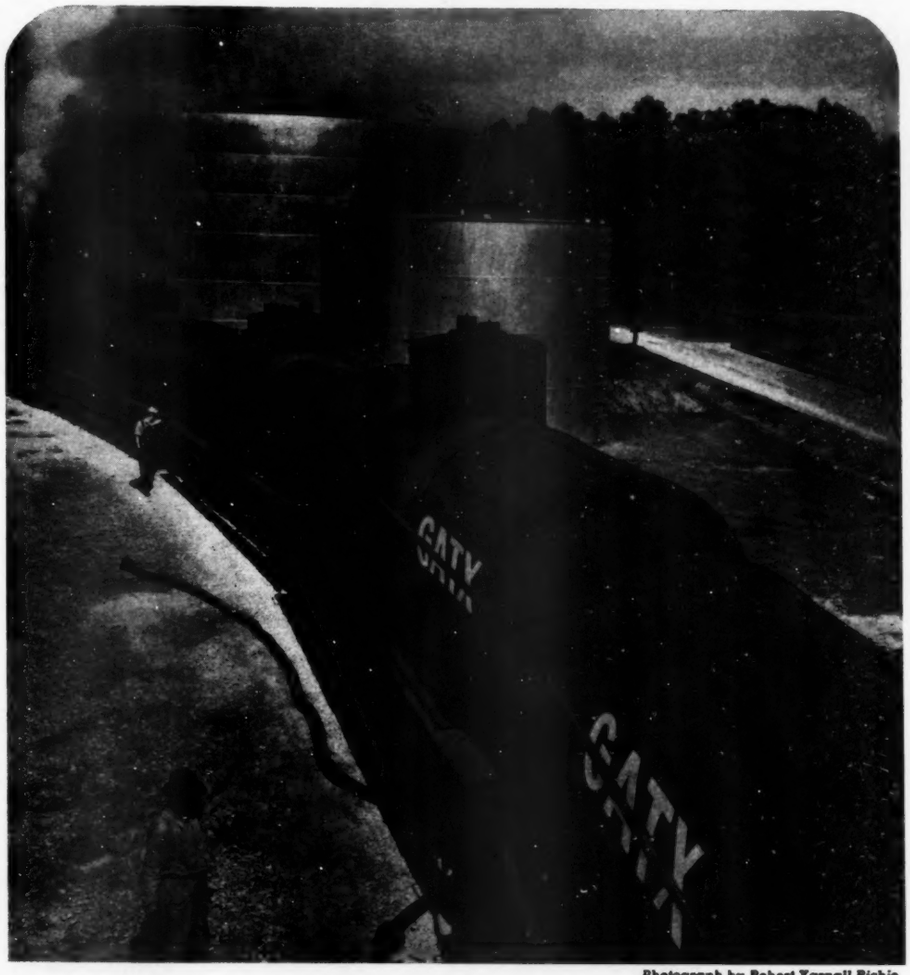
Warren County

Monarch 1 F. Hoadley.....NW NW 11-9n-1w
H.F.W., S.D.

Wayne County

Pure 1 C. Zimmerman.....W½ NW SE 25-2n-7e

(Continued on Page 86)



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A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

APPALACHIAN FIELDS

Only Routine Development In Eastern Gas Fields

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Dec. 2.—On Chestnut Ridge, in South Union Township, Fayette County, Pennsylvania, Peoples Natural Gas Co. completed 2 Piedmont Coal Co. at a depth of 6,817 ft. The elevation of this well is 2,024 ft. The Oriskany sand was topped at 6,691 ft., or at an elevation of 4,667 ft. subsea. Gas was found in this sand at depths of 6,637 ft. to 6,723 ft. The test of all gas in the well was 2,400,000 cu. ft. A roadway was being graded to the location for No. 4 on this tract.

During the past week 29 operations were completed in the lower eastern fields of which 4 were dry, 20 gas wells, and 5 oil producers with a daily initial of 38 bbl.

SUMMARY OF COMPLETIONS

SOUTHWEST PENNSYLVANIA

Fields—	No.	Prod.	Footage
Oil well	1	1	2,020
Gas wells	7	1.9	22,063
Dry hole	1	.....	3,638
Total completions	9	.....	27,721

WEST VIRGINIA

Fields—	No.	Prod.	Footage
Oil wells	4	33	7,774
Gas wells	13	14.9	45,150
Dry holes	3	.....	5,959
Total completions	20	.....	58,893

SOUTHWEST PENNSYLVANIA

In South Union Township, Fayette County, Peoples Natural Gas Co. is drilling 3 Piedmont Coal Co. at 5,120 ft. New Penn Development Co., William E. Snee et al are drilling at 1,340 ft. in 3 Summit Hotel (Heyn).

In North Union Township, Wasson et al are drilling at 6,652 ft. in 2 J. H. Sorg.

In Garrett County, Maryland, the New Penn Development Co., William E. Snee et al are drilling in the new hole at 6,378 ft. on the Humberson farm.

Allegheny County

Findlay Township: Stock Co. 1 C. F. Chubb, 1 bbl., Gordon 2,003-17 ft., oil at 2,006-17 ft., T.D. 2,020 ft.

Armstrong County

Cowanshannock Township: Equitable 1 Z. H. Hoover, 8,000 cu. ft. gas, Bradford, T.D. 3,638 ft.

Kiskiminitas Township: Shaw & Townsend 1 Michael Zitterberg, 353,000 cu. ft. gas, Bradford, T.D. 3,504 ft.

Wayne Township: Penn Wayne Co. 2 Ed Clever, 79,000 cu. ft. gas, Bradford.

Dan Sowers 2 William Rupp, small gas well in Bradford.

Clarion County

Red Bank Township: T. W. Phillips 1 E. C. Buffington, 70,000 cu. ft. gas, Bradford, T.D. 3,050 ft.

Fayette County

Nicholson Township: Greensboro 1 Frank Mozo, 600,000 cu. ft. gas, Fifth sand 2,266-2,388 ft., gas 2,302-06 ft., T.D. 2,404 ft.

Greene County

Jackson Township: Equitable 1 Ocie M. Kerr, 140,000 cu. ft. gas, Bayard 3,567-74 ft., gas 3,568 ft., T.D. 3,685 ft.

Washington County

Somerset Township: Carnegie 1 Mildred Nicholl, 1,543,000 cu. ft. gas, Fifty Foot sand, T.D. 2,420 ft.

WEST VIRGINIA

In Poca district, Kanawha County, Columbian Carbon Co. is drilling at 5,489 ft., Copenhaver heirs tract near Cooper's Creek. The company reached a depth of 6,378 ft. in the John Price well when the line cut the casing at 4,959 ft. The well has been shut down awaiting the casing crew.

In Grant district, Harrison County, Hope Natural Gas Co. is drilling at 8,580 ft. in its rotary test on the C. S. Gribble farm.

In Ravenswood district, Jackson County, Columbian Carbon Co. is drilling at 4,759 ft., P. F. Riggs; at 2,121 ft., F. F. Starcher; at 1,280 ft., F. L. Roligg.

In Ripley district, United Carbon Co. is drilling at 2,465 ft., B. B. Meadows.

Boone County

Scott district: Owens, Libby-Owens 1 Cassingham C. L. Co., 63,000 cu. ft. gas, Berea, T. D. 2,117 ft.

Braxton County

Birch district: Pittsburgh & West Va. 7771 E. R. Hall et al 262,000 cu. ft. gas, Blue Monday 1,752-1,800 ft., gas 1,793-97 ft., T.D. 1,832 ft.

Calhoun County

Center district: Bowser Oil & Gas Co. 2 Archibald Burrows, 60,000 cu. ft. gas, Maxon 1,843-95 ft., gas 1,848-58 ft. and 1,871-77 ft., T.D. 1,922 ft.

Sherman district: V. W. Hamilton et al 3 T. S. Cunningham, 10 bbl., Big Injun, T.D. 2,209 ft.

McCall Drilling Co., Inc. 2 Bud Kelly, 10 bbl., Squaw 2,210-40 ft., oil and gas 2,210-40 ft., T.D. 2,289 ft.

Hope Natural Gas Co. 8519 M. D. Fowler, 270,000 cu. ft. gas, Big Injun 2,090-2,152 ft., gas 2,124-50 ft., T.D. 2,188 ft.

Gilmer County

Center district: Hope 8516 C. N. Snodgrass, 28,000 cu. ft. gas, slate and shell 2,228-68 ft., gas 2,246-49 ft., T.D. 2,290 ft.

Glenville district: Carnegie 1 Sallie Showalter 41,000 cu. ft. gas, Big Injun 1,634-1,706 ft., gas 1,668-78 ft., T.D. 1,731 ft.

Troy district: Bruce Haney 1 Howard Scott, 10 bbl., Blue Monday, T.D. 1,652 ft.

Mingo County

Warfield district: McKinley Trent, trustee 3 N. A. Stepp, 298,000 cu. ft. gas, Brown shale, T.D. 3,365 ft.

Pleasants County

Washington district: W. C. Patterson Oil Co. 3 Calvin Conway, 3 bbl., Maxon, T.D. 1,624 ft.

Ritchie County

Grant district: F. S. Deem 6 L. C. Stephenson, dry, T.D. 1,980 ft.

Union district: Pittsburgh & West Va. 6117 Leland D. Heckert, dry, Berea, T.D. 2,405 ft.

Roane County

Harper district: O. H. Reed et al 4 M. J. Hughes, dry, Salt sand, T.D. 1,574 ft.

Upshur County

Buckhannon district: Pittsburgh & W. Va. 7766 C. D. Munson, Jr., 38,000 cu. ft. gas, Benson 4,647-63 ft., gas 4,650-55 ft., T.D. 4,658 ft.

ORISKANY GAS FIELDS

Jackson County

Ripley district: West Va. Gas 1 F. T. Huffman, 7,500,000 cu. ft. gas, Corniferous lime 5,054-5,158 ft., Oriskany 5,158-75 ft., gas 5,161-73 ft., T.D. 5,175 ft.

Washington district: United Fuel 4886 W. G. Good et al, 3,000,000 cu. ft. gas, Corniferous lime 4,823-4,935 ft., Oriskany 4,935 ft., gas 4,942-61 ft. and 4,973-75 ft., T.D. 4,994 ft.

Kanawha County

Poca district: Godfrey L. Cabot 5 D. Holmes Morton, 852,000 cu. ft. gas, Corniferous lime 4,885 ft., Oriskany 4,986 ft., T.D. 5,052 ft.

United Carbon 1 Robert Wines, 1,404,000 cu. ft. gas, Oriskany 4,976-5,017 ft., T.D. 5,051 ft.

United Carbon 1 Q. O. Tolley, 1,120,000 cu. ft. gas, Corniferous lime 4,854 ft., Oriskany 5,001 ft., T.D. 5,048 ft.

Permian Basin, Panhandle

(Continued from Page 62)

Sutton County

Domain 1 G. S. Allison, SW NE Sec. 91, Blk. 9, T. W. N.G. Sur., Ellenburger lime test, S.D. 1,098 ft.

NORTHERN WEST TEXAS

Early in the week a new field discovery was indicated in Cochran County at Atlantic 1 C. S. Dean, 3 miles southwest of the Duggan field, however, later in the week the well developed water and was preparing to plug back. The original total depth was 5,150 ft. and it will be plugged back to 5,114 ft. The best saturation and porosity was logged from 5,078 to 5,114 ft. There is some possibility that if a well is made, it will at some future date prove to be an extension to the Duggan field which was only a few months ago linked to the large Slaughter field to the east. The well is located 672 ft. from the north and 8,423 ft. from the east lines of League 89, Lipscomb County School Lands Survey.

Seminole Townsite

A wildcat test for the Seminole townsite about 1¼ miles east of production on the southeast edge of the Seminole field of Gaines County has been staked by W. E. Smith of Seminole. It will be 1 W. E. Smith, 20 ft. from the north and 45 ft. from the west lines of Lot 11, Block 38, Section 189, W.T. Survey, in the northeast southwest part of the section which falls within the townsite.

NORTHERN WEST TEXAS COMPLETIONS

Andrews County

Emma field: Adams & Bradley 4 University, 1,384 bbl., natural, tubing, 4,230-4,305 ft.

Cochran County

Duggan field: Magnolia 3-A Mallett, 798 bbl., 1-in. choke, 10,500 gal. acid, 4,940-90 ft.

Osage Drlg. 1-D Moore, 410 bbl., tubing, 10,000 gal. acid, 4,953-5,057 ft.

Gaines County

Seminole field: Amerada 1-A Florence, 513 bbl., ½-in. choke, natural, 5,132-5,376 ft.

Magnolia and Atlantic 5-251 H. & J., 714 bbl., ½-in. choke, natural, 5,120-5,316 ft.

Magnolia and Atlantic 5-251 H. & J., 659 bbl., ½-in. choke, natural, 5,160-5,307 ft.

Wasson field: Carter and Continental 1-A Willard, 762 bbl., 21/32-in. choke, 9,000 gal. acid, 4,854-5,030 ft.

Cedar Lake: Stanolind 1-B Riley, 4,585-4,737 ft., 1-in. choke, 425-qt. shot, 3,585-4,737 ft.

Hockley County

Slaughter field: Awoeb 1 Berry, 381 bbl., 1-in. choke, 10,000 gal. acid, 4,905-5,017 ft.

Awoeb 1-A Mid-Seale, 432 bbl., tubing and casing, 10,000 gal. acid, 4,910-5,008 ft.

Magnolia 1-F Mallett, 529 bbl., 1-in. choke, 10,500 gal. acid, 4,969-5,013 ft.

Magnolia 2-G Mallett, 600 bbl., 1-in. choke, 11,000 gal. acid, 4,947-5,026 ft.

Scurry County

Sharon field: Dobson & Robson 6 Burney, 162 bbl., pumping, 955-qt. shot, 2,229-2,430 ft.

Yoakum County

Wasson field: Aloco Oil 13-A Miller, 514 bbl., tubing, 10,000 gal. acid, 4,935-5,175 ft.

Aloco Oil 7-B Miller, 1,158 bbl., tubing, 10,000 gal. acid, 4,920-5,189 ft.

Basin States Oil 3 Fisher-Walker, 966 bbl., tubing, 10,000 gal. acid, 4,867-5,217 ft.

Don Danvers 8 Willard, 933 bbl., tubing, 10,000 gal. acid, 5,050-5,261 ft.

Denver Prod. & Ref. 21 Whittenburg, 1,115 bbl., tubing, 10,000 gal. acid, 4,812-5,130 ft.

Humble 10 Bennett, 800 bbl., ¾-in. choke, 11,000 gal. acid, 5,020-5,231 ft.

Sinclair Prairie 2-B Kendrick, 368 bbl., tubing, 6,500 gal. acid, 4,991-5,132 ft.

Skelly Oil 1 Comer, 575 bbl., 41/64-in. choke, 8,500 gal. acid, 5,095-5,210 ft.

T. P. Coal & Oil 5 Hearne, 492 bbl., tubing, 10,000 gal acid, 5,152-5,250 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M., Dec. 2.—A 3-mile north outpost is under way at the Dayton field of western Eddy County. The new test is Supes & Supes 1 Rogers, SE SW NE 10-18s-26e.

A wildcat a mile south and slightly west of the discovery well in the Dayton field was drilling ahead the past week. It is Bassett & Birney 1 Kimball, SE SE SE 26-18s-26e.

The Maljamar field west extension test which has been near completion for about 2 weeks reported a 24-hour gage, natural, at the close of the past week. It is Skelly Oil 1-B J. S. Lea, NE SE 23-17s-31e, in Eddy County. The well made a natural flow of 64 bbl. daily, through various size chokes, from pay 3,854-74 ft. It is to be acidized with 2,000 gal. before taking official gage.

The New Mexico Oil Conservation Commission last week set the state's allowable oil production for December at the same as the preceding month of November and slightly over the U. S. Bureau of Mines estimate of demand for the month. The December allowable is 104,000 bbl. daily, or 4,400 bbl. above the Bureau of Mines estimate.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

Red Lakes field: Sam Sanders 7 Berry, Sec. 24-17-27, pumped 20 bbl. daily, shot, 483-529 ft.

Leonard field: J. O. Wood 1 Root, Sec. 12-17-29, flowed 165 bbl. in 15 hr., open tubing, shot, 2,523-90 ft.

Dayton field: Brewer Drlg. Co. 1 Williams, Sec. 25-18-26, flowed 98 bbl. daily, open tubing, shot, 1,029-41 ft.

Barber field: Neil H. Wills 2 Keyes, Sec. 15-20-30, pumped 139 bbl. in 22 hr., natural, 1,626-67 ft.

High Lonesome field: Thomas & Bowers 1 Etz, Sec. 13-16-30, flowed 10 bbl. daily, open casing, natural, 3,140-3,200 ft., P.B. from 3,744 ft.

Loco Hills field: H. E. Yates 2 Travis, Sec. 6-18-29, flowed 30 bbl. daily, open tubing, shot, 2,445-3,100 ft., P.B. from 3,158 ft.

Lea County

Wildcat: Great Western 1-D State, SE SE Sec. 30-12-32, pumped 15 bbl. oil and 9 bbl. water, natural, 3,025-ft., P.B. from total depth 4,385 ft.

Penrose field: Stanolind 1 Owen, old well drilled deeper, new total depth 3,750 ft., new initial production 72 bbl. daily, flowing, 20/64-in. choke.

Lem Peters 2 Coll, old well drilled deeper, new total depth 3,688 ft., new initial production 20 bbl. daily, flowing through open tubing.

West Eunice field: Wilson Oil 8 Shell-State, Sec. 7-21-35, pumped 50 bbl. fluid, 7½ per cent water, after acid, 3,845-62 ft.

South Eunice field: Cities Service 5-B Closson, Sec. 18-22-36, flowed 90 bbl. in 5 hr., natural, open tubing, 3,785-3,816 ft.

SOUTHWEST TEXAS

By F. L. SINGLETON

Extensions Recorded for Three Fields in Starr County

CORPUS CHRISTI, Tex., Dec. 2.—With wildcatting at a low ebb, operators in the Southwest Texas district centered their attention around proven fields where several extensions were recorded, and other outpost wells in semiproven areas had reached critical stages.

Along the Frio-Vicksburg trend, and located in the northeast extension area of the North Rincon field, Starr County, Sun Oil Co. was extending production about 1,700 ft. north as 2 Saenz-State was flowing pipe-line oil while cleaning out through a 9/64-in. choke. The well is testing through perforated casing at 4,398-4,402 ft. in a new horizon several hundred feet higher than the company's 1 Saenz-State that was completed several weeks ago at 5,478-81 ft. This area is located about 1½ miles northeast of the discovery well.

In the same county, and located 1,650 ft. southeast of the discovery well of the Yzaguirre field, W. R. Davis 1 Seyfriedt flowed gas and distillate from perforated casing at 5,234-46 ft. and the well is now shut in. The well was drilled to a total depth of 6,006 ft. and 7-in. casing was cemented at 5,850 ft. Gas from the well will be sold as fuel for other operations which are expected to be started in the near future.

SUMMARY OF COMPLETIONS

CORPUS CHRISTI DISTRICT

Fields—	No.	Prod.	Footage
Oil wells	9	*797	59,267
Dist. wells	3	*175	19,365
Gas well	1	.....	5,403
Dry holes	3	.....	19,665
Total completions	16	.....	113,698

LAREDO DISTRICT

Fields—	No.	Prod.	Footage
Oil wells	7	*644	16,419
Gas wells	3	.....	8,099
Dry holes	3	.....	9,662
Total completions	13	.....	34,180

SAN ANTONIO DISTRICT

Fields—	No.	Prod.	Footage
Oil wells	2	*216	3,001
Dry holes	1	.....	1,406
Total completions	3	.....	4,407

*Barrels.

Boye Field Extension

A south extension to the Boye field, Starr County, was being recorded as Sun 1 Vela was showing for a producer while cleaning out through perforated casing at 3,185-90 ft. This well is a south offset of Barsodi 2 Vela, and casing was cemented for completion following a drill-stem test in the Pettus zone at 3,183-95 ft. which recovered 228 ft. of pipe-line oil. This area is located about 1½ miles south of the discovery well and the area is scheduled to receive an active drilling campaign. Locations for seven wells were made the past week for Barsodi Petroleum Co., all being located on the Vela 327-acre lease in Share 2-A Porcion 91 and 92.

Distillate production in the East Premont field, Jim Wells County, was extended about 1 mile north by the showing of Magnolia 14 A. A. Seeligson, which tested several hundred pounds working pressure and several feet of distillate on a drill-stem test at 6,295-6,300 ft. The well is being drilled deeper.

In the La Gloria field, Jim Wells County, La Gloria Operators Committee staked location for a well to be drilled in the center of Lot 2, Block 9, Los Olmos y Loma grant which adjoins the La Gloria townsite. This is the first of 16 wells which will be drilled in conjunction with a recycling project that will be constructed in the field.

To the south, and across the county line into Brooks County, West Production Co. 1 Ehlers, 5 miles northeast of Falfurrias continues to attract attention due to an attempted blowout which occurred at a depth of 8,889 ft. The drill stem became stuck and the operators are trying to recover it. The well is located on a geophysical prospect centering in the Loma Blanca grant in which protection acreage is held by several major companies.

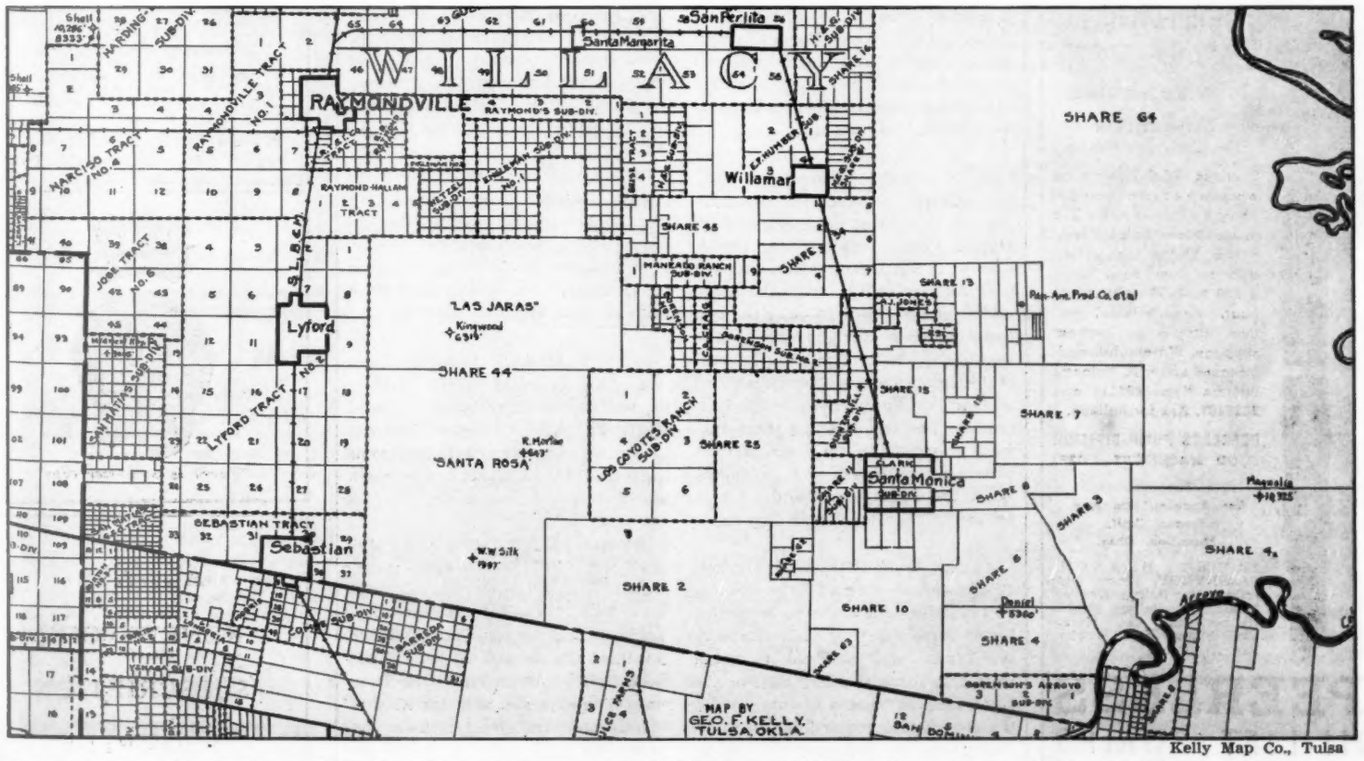
Corpus Christi Area

In the Corpus Christi area, and located on the Mud Island prospect, offshore from Aransas County in Aransas Bay, Gulfboard 1-239 State tested salt water and some oil with several hundred pounds of working pressure on a drill-stem test through perforated casing at 8,566-76 ft. A cement squeeze job is being made above and below the perforations and another test will be made at approximately the same level the first of the week.

Stanolind 2 J. A. Thompson, northwest of gas production in the Riverside field, Nueces County, is coring in shale below 6,586 ft. Sand with an oil odor was recovered in sidewall cores at 5,169-70 ft., while sand with a distillate odor was logged at 6,380-93 ft. A 10-minute drill-stem test at 6,576-86 ft. tested 16 lb. working pressure and 40 ft. of muddy salt water, while a 20-minute test in the same section tested 20 lb. working pressure and recovered 650 ft. of salt water.

One mile east of the Luby field, Nueces County, Seaboard 1 Chapman cored sand with an oil odor at 6,540-45 ft. and a drill-stem test recovered 30 ft. of oily salt water. Additional sand with an oil odor was cored at 6,599-6,604 ft. and the well is coring ahead after a 10-minute drill-stem test tested 4 lb. working

(Continued on Page 85)



Kelly Map Co., Tulsa

Corrected location of Pan American Production Co. 1 Garcia, the discovery well of the Willamar field, Willacy County. Location of this well which was published in a previous issue was in error

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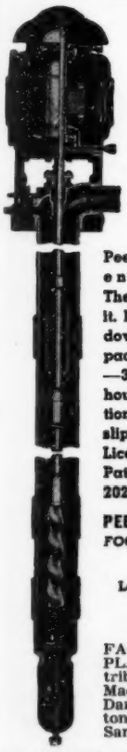

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Among the Drilling

HOUSTON Drilling Co., Houston, Tex., started drilling operations on an interesting Wilcox test in Fayette County, Texas, for O. C. Garvey. The well is located about 2½ miles northeast of Fayetteville on the A. Meyer lease.

DELTA Drilling Co., Tyler, Tex., is becoming increasingly active in exploratory work in eastern Texas, as evidenced by its several active operations and wildcat tests planned for the future. On the north end of the Chapel Hill field in Smith County the firm is drilling below 5,590 ft. in its 1 Browning, McDonald Survey, a Paluxy sand test. In Wood County the drilling company has a deal pending for a Woodbine sand wildcat to be drilled jointly with Sells Petroleum Co. of Dallas. It is to be on the Haynesville dome, northeast of Mineola and in the Cowan Survey. Definite plans have not yet been completed. In Rusk County the firm is planning a wildcat within the coming few weeks for the area north of Henderson. It is to be 1 Kangerga Brothers, on a block recently acquired from T. P. Cannon. The test will be carried to 8,000 ft.

GUS TSESMELIS, Alice, Tex., is preparing to move a rotary to Duval County, Texas, for 1 Rogers in Survey 275, about 1 mile south of Forest Development Corp. 1 Rogers, which extended production in Fitzsimmons field several months ago.

JOHN COALS, Gladewater, Tex., has received contract for the drilling of a wildcat in southwestern Marion County, East Texas border area. It is for J. D. Parsons and will be 1 Jackson, 430 ft. from the north and west lines of a 145-acre tract in the Alexander Albright Survey. The location is about 11 miles southwest of Jefferson and about 4 miles north of Harleton in northwest Harrison County. The test is along the southwest projection of the Rodessa fault zone and will test the Woodbine sand, the Paluxy, and the Rodessa section of the Glen Rose.

ALLEN & MORRIS, San Antonio, Tex., received contract from Coronado Corp. for a new test to be drilled in the Duck Bay field, Calhoun County, Texas, and material is being moved in for 6 Welder. East of the Luby field in Nueces County, Texas, the contractors are drilling an interesting test for Seaboard Oil Co. on the Chapman lease, while in the same county and located in the active Stratton area, one rotary is running for Navarro Oil Co.

LEONARD Drilling Co., of Mount Pleasant, Mich., last week was awarded contract for drilling an exploratory well for gas in Kalkaska County, northern Michigan. The test is the 1 Antrim Iron Co., in C SE 16-28n-7w, and is being drilled for the newly formed Monarch Development Co. The company controls approximately 60,000 acres in the district. Monarch will test the Antrim beds, which are expected at 1,200 to 1,300 ft., with several test wells.

GEORGE ECHOLS, Houston, Tex., will move a rotary to the Cypress area, Harris County, Texas Gulf Coast, as soon as weather permits to drill a 7,500-ft. wildcat on the Hardison lease in the J. W. Moody Survey. The well is being drilled jointly with John Mayo. In the Westwego area, Jefferson Parish, coastal Louisiana, Titanic Oil Co. 1 Marrero, a prospective pool opener, is drilling in sidetracked hole due to mechanical trouble as the result of excessive gas pressure.

LOFFLAND BROTHERS, Houston, Tex., received contract for a 9,500-ft. wildcat to be drilled in the Chenango area, Brazoria County, Texas. The well is located southwest of Chenango on the James Christian lease and will be drilled for J. Newton Rayzor.

CHRISTIAN-CARPENTER Drilling Co., Houston, Tex., is attempting to complete another well in the Ogburn field, Harris County, Texas, as a production test is being made at the company's 1-A Backen after drilling to a total depth of 6,939 ft.

H. J. DeARMAN, Houston, Tex., is rigging up for a 5,000-ft. wildcat located in St. Mary Parish, coastal Louisiana, for W. C. Hertel. The well is located on the Paul Bourgeois lease in 49-13s-8e, about 1 mile north of the town of Jeanerette.

PECK & CROFT Drilling Co., Midland, Tex., has been awarded contract to drill a recently staked Delaware test in Loving County, West Texas. It will be for Sloan & Zook, Bradford, Pa., and is to be 1 T.&P. Land Trust, contracted to the Delaware lime expected at about 3,700 ft. The location is about midway between the Kyle field and a lone gas producer by Tunstill completed 2 years ago. Acreage in the block has

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been purchased by George L. Livermore, Inc., and the El Paso Natural Gas Co. Having been assembled by Bruce McKague of Midland, the original 4,500-acre block was turned to Sloan & Zook for drilling.

SULTANA Drilling Co., Inc., of Shreveport, La., has the contract for the first two wells to be drilled in the Joaquin gas area, De Soto Parish, North Louisiana, for Southern Production Co., Inc.

NOBLE Drilling Co., Houston, Tex., marked up another producer for the Alta Loma field, Galveston County, Texas, with the completion of Stanolind 1 Hulen, and the rig will be moved to a new location.

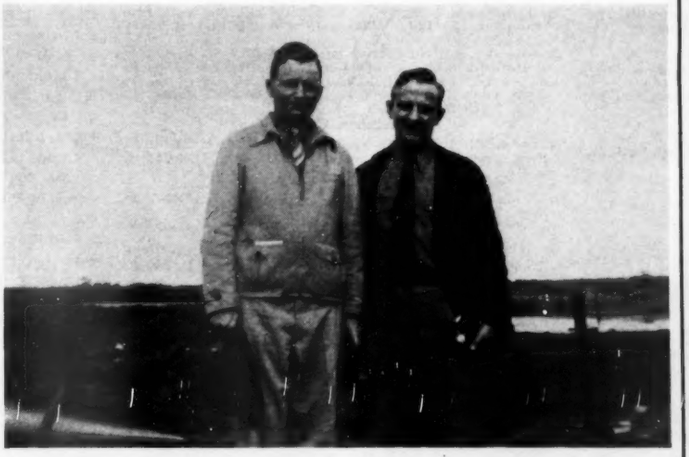
TRINITY Drillers, Inc., San Antonio, Tex., are moving equipment to a new location in the Willamar field, Willacy County, Texas, which was opened the previous week by the completion of Pan American Production Co. et al 1 Garcia.

LUPHER Drilling Co., Mount Pleasant, Mich., has been awarded contract for drilling the Pure Oil Co. 1 Goodrich, third offset to Rowmor Corp. 1 Wyman, which recently opened a new oil-producing area in Clare County, Michigan. Location of the 1 Goodrich is C E½ NE NE 32-20n-6w, southwest of the 1 Wyman, and at last reports the company was rigging up machinery. Lupher is also drilling the Pure Oil Co. 1 Payne, 3 miles west of the Rowmor discovery, which will do much to establish the importance of the new area. The 1 Payne at last reports was below 3,400 ft. and is expected to reach the pay zone possibly by this week end.

WIEGAND BROTHERS, San Antonio, Tex., are drilling below 4,000 ft. in George White 1 Poetter, an interesting wildcat test located about 1 mile northwest of the Slick field, De Witt County, Texas.

FALCON-SEABOARD Drilling Co., Houston, Tex., is running a protection string of 9⅝-in. casing at approximately 5,000 ft. in Pure Oil Co. 4 Newberry, a wildcat located near Brownsville, Cameron County, Texas.

MANNING & MARTIN, Denver, Colo., has spudded a wildcat for Continental Oil Co. and Texas-Gulf Production Co. on the Rocky Point structure of Campbell County, northern Wyoming. The test, 1 Knapp, is located in C NE SW SE 4-56n-69w. Operators plan to drill to about 5,000 ft., with the primary objective, the Sundance, expected at around 3,800 ft. and the Leo levels within the next 1,000 ft. A heavy-duty rotary will be used. A previous test was drilled on the Rocky Point structure early in the twenties, but was not carried to any conclusive depth. Present test was spotted after an extensive geophysical survey made during the past summer.



C. J. Siemoneit of Taubert-McKee-Siemoneit Drilling Co., Fort Worth, Tex., and George Abell, independent operator of Midland, Tex., who has been active in developments in Pecos County, West Texas. The operators were caught at the drilling firm's 1 V. W. Crockett in Pecos County, an Ordovician (Simpson) discovery which was recently completed for 933 bbl. of oil in 12 hours, flowing through ½-in. choke. In the lower left the discovery well may be seen making a flow

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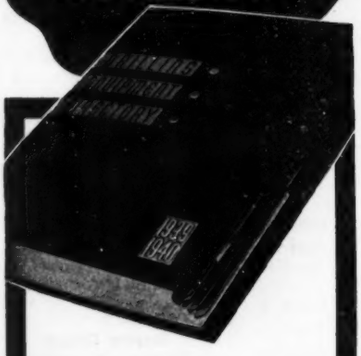

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Two Dry Holes in Clinton Sand Slow Ohio Deep Sand Play

By STAFF CORRESPONDENT

NEWARK, Ohio, Dec. 2.—Clinton sand prospects in northeastern Ohio were dimmed by the Magnolia company finding the horizon dry in Ashtabula County and the test of Bendum-Trees in Geauga County yielding only a small showing of gas. Magnolia 1 Breley Bros., Ashtabula County, Harperfield Township, Lot 43, had the bottom of the lime at 2,900 ft., Clinton 3,065-75 and 3,105-53 ft. dry; Red sand 3,205-3,341 ft. dry. In Geauga County Benedum-Trees 1 W. C. White, Section 6, Chester Township, was through the lime at 3,477 ft. and picked up the Clinton at 3,589-3,671 ft. with 35,000 cu. ft. gas at 3,617-20 ft.; gas increased to 400,000 cu. ft. after shot but blew down to 5,000 cu. ft. in 72 hours. Both tests are shut down.

SUMMARY OF COMPLETIONS

OHIO

	No.	Prod.	Footage
Oil wells	2	*4	1,200
Gas wells	12	†12.5	39,616
Dry holes	13	.....	31,161
Total	27	.....	61,977

EASTERN KENTUCKY

Gas wells	12	†11.0	27,785
Dry holes	5	.....	‡6,493
Total	17	.....	34,278

WESTERN KENTUCKY

Oil wells	3	*180	2,599
Dry holes	5	.....	5,734
Total	8	.....	8,333

INDIANA

Oil wells	6	*1,138	16,144
Gas wells	1	.....	980
Dry holes	4	.....	4,422
Total	11	.....	21,546

*Barrels. †Million cu. ft. ‡Footage not reported in two wells.

In the Central Ohio area, Jersey Township, Licking County, McClay, Inc., is drilling at 3,942 ft., 622 ft. in the Trenton.

There were 27 completions reported in the Ohio fields; 4 oil wells, 12 gas wells and 13 dry holes. Ashland, Medina and Muskingum counties yield fair gas wells, the largest one gaging 4,100,000 cu. ft.

Ashland County

Orange Township: Ohio Fuel 1 Mary Gantz, Sec. 13, 2,000,000 cu. ft. gas, Newburg, T.D. 2,500 ft.

Athens County

Canaan Township: Nuzum 2 George G. Gaul, Sec. 17, dry, second Berea, T.D. 1,640 ft.
Lodi Township: C. P. Bowman 1 G. R. Burson, Lot 13, dry, second Berea, T.D. 1,621 ft.

Fairfield County

Berne Township: City Natural 2 R. J. Conrad, Sec. 27, dry, Berea, T.D. 482 ft.

Hocking County

Ward Township: Preston 1737 Sunday Creek Coal Co., Lot 11, dry, Clinton, T.D. 3,563 ft.

Holmes County

Paint Township: Ohio Fuel 1 Levi Yoder, Sec. 29, 360,000 cu. ft. gas, Clinton, T.D. 4,201 ft.
Richland Township: Ohio Fuel 1 A. A. Starner, Lot 1, 85,000 cu. ft. gas, Clinton, T.D. 3,332 ft.

Jefferson County

Island Creek Township: John M. Elliott Oil Co. 1 Laurence F. Andrew, Lot 7, 2 bbl., Berea, T.D. 460 ft.

Licking County

Madison Township: Rexroth Oil Co. 5 S. E. and Annie Walpole, Lot 23, 2 bbl., Berea, T.D. 740 ft.

Newark Field—Licking County

Mary Ann Township: Ohio Fuel 1 B. R. Glover, 100,000 cu. ft. gas, Clinton, T.D. 2,675 ft.
Newton Township: Alley Willey et al 1 Harold Holtz, Lot 1, fourth quarter, 450,000 cu. ft. gas, Clinton, T.D. 2,578 ft.
Alley Willey et al 1 Isaac Weiss, north part of first quarter, dry, Clinton, T.D. 2,656 ft.

Medina County

Spencer Township: East Ohio 2 H. C. Hange, Sec. 10, 2,500,000 cu. ft. gas, shot, Clinton, T.D. 2,483 ft.
Glenn Harmon 2 C. E. Monosmith, Sec. 12, dry, no Clinton sand, T.D. 2,689 ft.

Meigs County

Sutton Township: B. M. Tyree et al 1 Irwin Karr, Lot 299, 21,000 cu. ft. gas, shale, T.D. 3,026 ft.

Monroe County

Sunsbury Township: Barnesville Dev. Co. 1 Alva Pittman, Sec. 27, dry, Keener, T.D. 1,705 ft.
Wayne Township: Paulus et al 1 R. W. Ullman, Sec. 33, 50,000 cu. ft. gas, Berea, T.D. 1,993 ft.

Muskingum County

Brush Creek Township: Pure 1 C. B. Watson, Sec. 15, 2,200,000 cu. ft. gas, Clinton at 4,160-4,207 ft., T.D. 4,212 ft.
Ohio Fuel 1 M. McClaughlin, Sec. 15, 4,120,000 cu. ft. gas, Clinton 3,974-4,009 ft., T.D. 4,011 ft.

Noble County

Center Township: Bartlesville Dev. Co. 1 O. E. Heiszler, Sec. 23, 130,000 cu. ft. gas, ½ hr. after shot, Clinton, T.D. 5,800 ft., testing.
Seneca Township: Chaseville Oil & Gas Co. 1 Martha Henderson, Sec. 31, dry, Berea, T.D. 1,696 ft.

Perry County

Reading Township: Preston 1 Lawrence Love, Lot 2, 342,000 cu. ft. gas, T.D. 2,805 ft.
Thorn Township: Ohio Fuel 1 E. F. Winegartner, Sec. 28, dry, Clinton, T.D. 2,741 ft.

Stark County

Plain Township: East Ohio 2 J. L. Linder, Sec. 13, dry, Clinton, T.D. 4,750 ft.

Tuscarawas County

Oxford Township: Hartman 1 Wilma Couts, Sec. 21, dry, Berea, T.D. 1,246 ft.
York Township: J. A. Upham 1 W. F. Mutti, Sec. 15, 60,000 cu. ft. gas, Clinton, shot, plugged, T.D. 4,692 ft.

Vinton County

Richland Township: Kelch Bros. 1 Varine Secrest, Sec. 12, show of gas, Ohio shales, shot, plugged, T.D. 1,688 ft.

INDIANA

EVANSVILLE, Ind., Dec. 2.—Indiana had a normal week with the completion of six oil wells, one gasser, and four dry holes. The total initial production for the six producers was 1,138 bbl., or 173 bbl. per well. This was a slight increase over the normal production for Indiana. The majority of the activity was concentrated in Posey and Gibson counties, which reported four completions each. Drilling activity increased slightly in the Vincennes area, although no completions were reported for the new Vincennes field during the week.

INDIANA COMPLETIONS

Gibson County

Newton P. L. 1 Prud. Life Ins. ...NE NE NE 35-1s-10w
Rig abandoned.
Hall Edwards 1 Maier .....SW SE NE 14-3s-14w
Pumped 150 bbl., 3,000 gal. acid 2,861-66 ft., T.D. 2,866 ft.
Joe Bander et al 40 Cooper .....NW NW SE 13-3s-14w
Pumped 250 bbl., 70-qt. shot 2,480-99 ft., T.D. 2,502 ft.
Lewis Prod. (Loma Oil) 1 Brady ...NE NE SW 14-2s-12w
Dry, Glen Dean 1,839 ft., Ste. Genevieve 2,337 ft., T.D. 2,413 ft.

Hamilton County

N. N. Smith 1 Pedigo ..... NE NE 28-18n-3e
Dry, Trenton 1,001 ft., water 1,006-11 ft., T.D. 1,011 ft.

Harrison County

Indiana Util. Corp. 1 Conrad .....SE NE NW 32-3s-4e
Dry, T.D. 828 ft.

Henry County

W. M. Fridley 1 fee ..... W½ E½ NE 12-17n-9e
25,000 cu. ft. gas 971-80 ft., Trenton 963 ft., T.D. 980 ft.

Jasper County

A. C. Thomas 1 Convere .....SW SW SW 1-29n-6w
Dry, T.D. 170 ft.

Posey County

C. W. McKeeken et al 4 Keck ....NW SW NW 35-3s-14w
Pumped 60 bbl., 85-qt. shot 2,502-31 ft., T.D. 2,538 ft.
Continental 3 Kleiderer-A ..... SE NE NE 33-3s-14w
Pumped 278 bbl., 4,000 gal. acid, perf. 2,884-2,900 ft., T.D. 2,914 ft.
Continental 16 Bozeman .....SW NE NE 23-3s-14w
Pumped 288 bbl., natural, sand 2,492-2,523 ft., T.D. 2,523 ft.
R. L. Bauman et al 2 Kleiderer .... SE SE SE 23-3s-14w
Pumped 112 bbl., 20-qt. shot, 2,788-98 ft., T.D. 2,801 ft.

WESTERN KENTUCKY

OWENSBORO, Ky., Dec. 2.—Three oil wells and five dry holes were completed in western Kentucky during the past week.

Christian County

Bluff Springs district: Thomas 1 G. L. Worsham, dry, T.D. 1,001 ft.

Daviess County

Handyville district: Master 10 E. W. Richmond, 100 bbl., 80-qt. shot, Jett sand 1,164-89 ft.
C. T. Johnston, trustee, 1 L. I. Iglehart, dry, T.D. 1,352 ft.
Utica district: Miller 4 S. S. Nalley, dry, T.D. 1,786 ft.
Ellis et al 1 J. H. Mohon, spudding in.
Miller 5 S. S. Nalley, moving in.
Pleasant Ridge district: Gibson et al 5 T. T. Church, 70 bbl., 140-qt. shot, Jackson sand 956-21 ft., Barlow sand 1,034-58 ft., T.D. 1,059 ft.

Hancock County

Hawesville district: S. Zanetis et al 2 Sam Meserve, dry, T.D. 953 ft.

Henderson County

Harrison Island in Ohio River, near Mount Vernon, Ind.: L. F. Boone et al 1 Harris et al, drilling at 900 ft.

Muhlenburg County

Breman district: Peerless 1 Elmer Noftsinger, moving in.

Ohio County

Fordsville district: Miller 2 O. L. Mason, dry, T.D. 397 ft.
Sohio 17 Sallie J. Bedell, 10 bbl., 60-qt. shot, Jett sand 325-51 ft.
Hitesfali district: Parks 2 Wed. Davidson, dry, T.D. 245 ft.

EASTERN KENTUCKY

ASHLAND, Ky., Dec. 2.—A number of gas-well completions mark the report of operations in Eastern Kentucky this week. A month-end report, received today, shows activities to be pointing slightly upward with a number of other wells nearing the completion stage. The second surge of winter in this part of the state has failed to retard drilling operations up to the present time.

The Kentucky-West Virginia Gas Co. reports the completion of No. 5257 on the R. C. Stafford tract on Mullett Branch of Rockcastle in Martin County at a total depth of 1,306 ft. in Big lime. The well is making 64,000 cu. ft. of gas, 48 hours, 300 lb. rock pressure.

The Kentucky-West Virginia Gas Co. also reports the completion of No. 5270 on the Preston Hall land on Dry Creek in Knott County at a total depth of 2,970 ft. The well is making 4,000,000 cu. ft. of gas in Big lime and 77,000 cu. ft. in shale.

Columbian Fuel has completed No. GW-843 on 1 W. K. Elliott, on Levisa Fork in Pike County at a total depth of 3,200 ft. and the well has a daily production of 140,000 cu. ft. of gas.

Columbian Fuel reports the completed log in on No. GW-840, on the Benton Smith land No. 4 on Benton Branch in Pike County as a daily 1,641,000 cu. ft. gas producer at a total depth of 1,580 ft. in Brown shale.

Columbian Fuel also gives the completed log in of No. 841, Tierney land No. 15, on Scant Branch in Pike County as producing 783 cu. ft. of gas daily at a total depth of 1,210 ft. in Salt sand.

Another Columbian Fuel completion is No. GW-805 on the Laws heirs land on Clark Branch in Floyd County at a total depth of 1,567 ft. in Maxon with a daily gas production of 1,107,000 cu. ft.

United Carbon has completed No. 864, Kycoga Land Co. No. 12, on Alum Cave Branch and the log in gives a 516,000-cu. ft. daily gas production at a total depth of 2,967 ft. in shale.

United Carbon found show of gas (84,000) from 2,128 to 2,135 ft. in Big lime in No. 865, W. S. Wells, on Levisa Fork in Pike County with the well reaching a total depth of 2,160 ft.

United Carbon also reports the completed log in of No. 866 on the J. I. Kay tract, No. 1, on Island Creek in Pike County with a daily gas flow of 267,000 cu. ft. at a total depth of 3,209 ft. in shale.

Hamilton Gas Corp. has completed No. E-19 on the John L. Triplett land on Jones Fork in Knott County at a total depth of 2,390 ft. in Brown shale with a daily gas production of 381,000 cu. ft.

John Allen et al reports the completion of No. 1 on the Lige Spears land on Home Branch in Floyd County at a total depth of 1,608 ft. in Big lime. The well is making 1,500,000 cu. ft. of gas daily.

Whitis & Sears have completed No. 1 on the Varney farm on Road Fork in Pike County at a total depth of 1,642 ft. in Maxon with a daily gas production of 535,000 cu. ft.

E. C. Ware et al give the completed log of No. 1 on the G. A. Cline farm on Middle Fork in Martin County as a 84,000-cu. ft. daily gas producer at a total depth of 2,522 ft. in shale.

Dr. Brewer reports the completion of No. 1 on the

(Continued on Page 88)

Saturated Eocene Sand Found In Wheeler Ridge District

By L. P. STOCKMAN

LOS ANGELES, Calif., Dec. 2.—Richfield Oil Corp. focused the attention of operators on the Wheeler Ridge district this week by coring 63 ft. of Eocene oil sand in the interval of 10,870-10,934 ft. Lower 12 in. was a gray sand but the significance of this remains to be determined. The oil sand showed a good saturation and with a favorable porosity should result in commercial production. The company immediately landed a string of casing preparatory to an early test. The Wheeler Ridge district of Kern County is located in the extreme southern end of the San Joaquin Valley and high up in the foothills that parallel the mountains separating the San Joaquin and Los Angeles basins. Richfield cored this promising Eocene oil sand in 2 Kern County Land in 28-11n-20w and if it results in commercial production it will mean the discovery of a new oil field located across the canyon and south of the present Wheeler Ridge field which is producing from the Miocene. It may also mean that the existing Wheeler Ridge field may contain production in the underlying Eocene. No. 2 Kern County Land is the second wildcat drilled in the Wheeler Ridge area by Richfield Oil Corp. The showing of 1 Kern County Land resulted in the drilling of the second well which is located 2,039 ft. south and 104 ft. east of the center of 28-11-20 and about 1,350 ft. south of No. 1. The latter well was abandoned after producing for a few weeks when production failed to hold up. This well encountered oil showings in the Vedder sand at 8,570-8,765 ft. but developed possible edge water and was accordingly deepened. At 10,815-11,166 ft., 1 Kern County Land cored some unproductive oil sand in the Oligocene. The importance of Richfield's find in the Wheeler Ridge district should be determined within the next several days provided a satisfactory water shutoff is effected.

AVERAGE DAILY PRODUCTION

LEADING CALIFORNIA FIELDS

	Nov. 30	Nov. 23
Wilmington	81,425	82,125
Long Beach	41,925	42,250
Midway-Sunset	39,575	41,750
Kettleman North Dome	38,425	39,750
Coalinga	35,750	29,500
Ventura Avenue	33,725	33,750
Santa Fe Springs	24,800	25,475
Huntington Beach	24,750	26,750
Dominguez	21,750	20,850
Santa Maria Valley	18,725	20,250
Montebello	16,475	16,750
Total California	595,750	605,750

Ten Section

Shell Oil Co., which has been developing the Ten Section field of Kern County for the past 6 months by the slim-hole drilling method exclusively, completed two wells in that field during the current week although actual production gage was only taken on No. 45-30 Kern County Land. This well has the distinction of being drilled with a string of tubing instead of the usual drill pipe. Shell has been doing considerable experimental work with slim-hole drilling in the Ten Section field which appears ideally suited for this type of work. Instead of using the usual string of drill pipe, Shell used 4½-in. tubing which upon conclusion of drilling operations was landed at 8,220 ft. and cemented through perforations at 8,030 ft. Perforations open to the productive Stevens oil sand were placed at 8,031-8,220 ft. and the well was brought in flowing 1,825 bbl. of clean 31.1-gravity oil daily.

Union Oil Co. is expected to extend the northern limits of production in the Rio Bravo field of Kern County within the next few days by completing 72-28 Crites as this well has found both the Rio Bravo and Vedder zones. Top of the Rio Bravo oil sand was cored at 11,243 ft. and top of the Vedder oil sand was logged at 11,339 ft. The finding of both zones in this well has stimulated interest in this end of the structure although it is definitely known that the edge is not very far removed. When Union found these two zones carried oil, Superior Oil Co. immediately staked location for 2 Mandell east of 72-28 Crites.

SAN JOAQUIN VALLEY COMPLETIONS

Coles Levee Field

Ohio 11-F Kern County Land 3-31s-25e
Flowed 872 bbl., 50.8-gravity, 0.9 per cent cut, 7,847,000 cu. ft. gas. 48/64-in. bean. Pressures 1,175/1,900 lb. Elev. 306 ft. T.D. 9,505 ft. in Stevens oil sand. 7-in. water string cemented 9,035 ft. 507 ft. 4¾-in. liner landed 9,503 ft. 100-mesh perf. open to production 9,050-9,503 ft. 9,471 ft. 2½-in. tubing including 240 ft. 2-in. N point 8,681 ft., top producing oil sand 9,034 ft. 97 days total elapsed drilling time. Kern County.

Richfield 74-4-B Kern County Land 4-31s-25e
Flowed 1,600 bbl., 44.8-gravity, 2 per cent cut, 9,400,000 cu. ft. gas. Two 1½-in beans. Pressures 600/1,500 lb. Elev. 307 ft. T.D. 9,700 ft. in Stevens sand. 8⅝-in. water string cemented 9,100 ft. 670 ft. 6⅝-in. liner landed 9,695 ft. Perf. open to production 9,110-9,214 ft., 9,255-9,360 ft., 9,380-9,693 ft. 9,652 ft. 2½-in. tubing. 59 days total elapsed drilling time from spud. Kern County.

Delano (Trico) Gas Field

Union 1 Seymour 20-24s-23e
Flowed 10,286,000 cu. ft. dry gas. Casing open and ¾-in. tubing bean. Pressure 525 lb. On 30-minute test through 30/64-in. casing bean well flowed 6,350,000 cu. ft. daily rate, 718 lb. pressure. Shut-in pressure 1,050 lb. Elev. 211 ft. T.D. 2,461 ft. 6⅝-in. water string cemented 2,387 ft. 94 ft. 4¾-in. liner landed 2,461 ft. 60-mesh perf. open to production 2,376-2,461 ft. 2,457 ft. 1½-in. tubing. Well appears to be highest structurally in field. 8 days total elapsed drilling time from spud. Tulare County.

Greeley Field

General Petroleum 2 Oughton 12-29s-25e
Flowed 658 bbl., 38.8-gravity, 0.2 per cent cut, 2,000,000 cu. ft. gas. 13/64 to 10/64-in. bean. Pressures 1,500/1,550 lb. Elev. 336 ft. T.D. 11,509 ft. 5½-in. water string cemented 11,288 ft. 285 ft. 4-in. liner landed 11,509 ft. Perf. open to production 11,289-11,509 ft. 11,454 ft. 2-in. tubing. Completed in Rio Bravo and Vedder oil zones. Top Rio Bravo 11,294 ft., base Rio Bravo 11,330 ft., top Vedder 11,353 ft. Bottomed in Vedder zone oil sand. 90 days total elapsed drilling time. Kern County.

McKittrick Field

Franco-West. 19 Front 8-30s-22e
Pumped 275 bbl., 19.1-gravity, 0.5 per cent cut. Elev. 883 ft. T.D. 2,224 ft. Redrilled and deepened from 981 ft. 8⅝-in. water string cemented 2,122 ft. 120 ft. 7-in. liner landed 2,223 ft. 80-mesh perf. open to production 2,123-2,223 ft. 2,005 ft. 2½-in. tubing. Top oil sand 2,120 ft. Bottomed in oil sand. Kern County.

Midway-Sunset Field

Standard 52-15-D fee 15-32s-24e
Pumped 135 bbl., 27.3-gravity, 5 per cent cut. Elev. 864 ft. T.D. 3,410 ft. Deepened from 3,320 ft. 8⅝-in. oil string cemented 3,320 and perf. 3,300-20 ft. 125 ft. 6⅝-in. liner landed 3,410 ft. Perf. open to production 3,319-3,410 ft. 3,120 ft. 2½-in. tubing. Kern County.

Rio Bravo Field

Union 58-34 Kern County Land 34-28s-25e
Flowed 975 bbl., 32.3-gravity, 0.5 per cent cut, 1,400,000 cu. ft. gas. 48/64-in. bean. Pressures 1,500/1,550 lb. Elev. 338 ft. T.D. 11,498 ft. in Rio Bravo sand. 7-in. water string cemented 11,148 ft. 65 ft. 5-in. liner landed 11,496 ft. Perf. open to production 11,453-96 ft. 10,530 ft. 2½-in. tubing. Top Rio Bravo oil sand 11,452 ft. Did not drill to Vedder zone. Kern County.

Ten Section Field

Shell 45-30-A Kern County Land 30-30s-26e
Flowed 1,825 bbl., 31.1-gravity, 0.9 per cent cut, 1,900,000 cu. ft. gas. 32/64-in. bean. Pressures 1,200/1,250 lb. T.D. 8,220 ft. in Stevens sand. 4½-in. casing landed 8,220 ft. and cemented through perf. 8,030 ft. Perf. open to production 8,031-8,220 ft. N point 7,545 ft. Top first oil sand 7,835 ft. Kern County.

SAN JOAQUIN VALLEY OUTPOSTS

Coles Levee Field

Standard 20-8 Kern County Land 5-31s-25e
Drilling 5,210 ft. in sandy shale. Cemented 13⅜-in. surface pipe at 1,143 ft. with 650 sacks cement. Kern County.

Kettleman North Dome Field

Standard 344-13-H fee 13-21s-16e
Drilling in Eocene hard sand and shale 10,775 ft. Formation test 10,674-10,775 ft., open 1 hr. and 10 min., recovered 360 ft. net of oily gassy mud. Fresno County.

Standard 1-1-U fee 1-23s-16e
Drilling in hard shale 9,580 ft. Kings County.

Midway-Sunset Field

No. Amer. Consd. 1-28 W.P. 28-32s-23e
T.D. 1,652 ft. Kern County.

Paloma Field

Western Gulf 12-12-B Kern County Land .. 12-32s-26e
Drilling in sandy shale 7,840 ft. Kern County.

Rio Bravo Field

Union 72-28 Crites 28-28s-25e
Drilling in Rio Bravo oil sand at 11,469 ft. Running low structurally. Kern County.

Union 76-27 Kern County Land 27-28s-25e
T.D. 11,576 ft. in barren gray sand. Rio Bravo and Vedder zones barren. P.B. 8,150 ft. Redrilling 8,099 ft. Kern County.

Union 41-33 Pacific States 33-28s-25e
Derrick. Kern County.

Round Mountain Field

Spartan Drlg. Co. 1 Hiatt 32-28s-29e
T.D. 2,089 ft. Sidetracked fish to 2,085 ft. Having trouble with fish. May drill new hole.

Strand Field

Associated 25-7-E Kern County Land 7-30s-26e
Drilling 10,430 ft. in hard sand and shale. Kern County.

Wasco Field

Pacific Western 1 Meyer 7-27s-24e
T.D. 13,150 ft. Drilled through 7-in. casing 10,968 ft. Now redrilling 12,961 ft. Kern County.

Wheeler Ridge

Richfield 2 Kern County Land 28-11n-20w
T.D. 10,934 ft., cored 64 ft. of Eocene oil sand. Reaming to land and cement 7-in. casing. Looks very promising. Kern County.

SAN JOAQUIN VALLEY WILDCATS

Panchoe District

Jergins Trust 2 Cheney 29-14s-13e
Drilling 120 ft. in sand and shale. Fresno County.

Buena Vista Hills District

Honolulu 25-P fee 10-32s-24e
Drilling 10,475 ft. in hard tight gray shale with streaks of sand and silt, giving no cuts. Kern County.

Potrero Hills District

Richfield 3 Potrero 10-4n-1w
Building rig. Solano County.

Pyramid Hills District

Associated 31 West Slope 20-24s-18e
Drilling 1,980 in Cretaceous shale. Kern County.

Rio Bravo District

Wilshire 1 Campen 1-29s-25e
Drilling 8,968 ft. in sandy shale. Kern County.

Rumsey Hills District

Standard 1 Tippetts 9-12n-3w
T.D. 2,455 ft., P.B. 2,090 ft. to redrill. Yolo County.

Sacramento District

Ind. Expl. Co. 1 Unit Plan 19-7n-6e
Drilling 1,298 ft. in sand and shale. Sacramento County.

Tejon District

Richfield 1 Tejon Ranch 2-10s-19e
Drilling 8,652 ft. in gray sand and shale. Kern County.

Union Avenue District

Hancock 1 Roberts 6-30s-28e
Drilling 1,873 ft. Cemented 13⅜-in. surface pipe at 835 ft. Kern County.

COASTAL DISTRICT

Union Oil Co. confirmed the find of Standard Oil Co. in the Los Flores district of Santa Barbara County this week by completing 11 Bell in 27-9n-33w flowing 950 bbl. of clean 16.3-gravity oil per day from 5,800 ft. Due to the limited data available it is impossible to determine definitely whether this work represents a new separate field or whether Union 11 Bell and Standard 1 Los Flores are outposts in the old Cat Canyon field. Very little is known of structural conditions in the Cat Canyon field due to its age and the fact that most wells were drilled a number of years before the advent of coring and other modern methods of drilling. Each of two possible theories is tenable and for this reason the importance of this discovery must be held in abeyance. It is interesting to note, however, that Union 11 Bell is about 500 ft. higher structurally than Standard 1 Los Flores and produces a higher-gravity oil. Standard's well yields a crude oil testing 13.6-gravity and 11 Bell produces a crude oil testing 16.3° A.P.I. Both wells are only a relatively short distance apart and both are located in the same section, 27-9-33.

Del Valle Field

In the Del Valle field discovered a few months ago R. E. Havenstrite is making hole in No. 2 Lincoln below 4,000 ft. and is grading road to the location

selected for No. 3 Lincoln. Nos. 2 and 3 are lower structurally than the discovery well that proved up this new field, as it is hoped that a more favorable gas-oil ratio could be obtained by drilling outside of the gas-cap area on the crest of the structure. The Newhall-Castaic region, which was brought into the limelight a few months ago by Havenstrite's discovery, is showing a slow but steady increase in development work. Western Gulf Oil Co. is making preparations to start a new well on the Lechler property in 31-5n-17w, in Oak Canyon, and this wildcat should begin making hole within the next 2 weeks provided no unforeseen delay arises. Some distance north British American Oil Producing Co. has abandoned 1 Edwina in 11-3n-16w as a duster at 6,195 ft. In the Aliso Canyon district, which is controlled exclusively by Tide Water Associated Oil Co., three wells are drilling and derricks are standing for two additional wells. This company has scheduled 24 Porter for completion within the next few days at 5,365 ft. and the expectation is for a good flowing well from the Miocene. In the Newhall-Potrero field Barnsdall Oil Co., in addition to its current completion, is making hole in 15 Rancho San Francisco and is preparing to spud in No. 16 on the same property.

Ventura Avenue

Lloyd Corp. is putting the finishing touches on 5 Lloyd, an outpost in the extreme eastern end of the Ventura Avenue field, at 10,475 ft. and a production test is scheduled to be made within the next few days. This outpost has 1,375 ft. of blank 5-in. liner cemented at 10,440 ft. and if a satisfactory water shutoff is made the company will proceed with the projected production test at once. Sufficient oil sand has been cored to indicate the possible completion of an excellent well, and for this reason the outcome of the production test will be watched with interest. Development work by Lloyd Corp. during the past year or so in the eastern end of the Ventura Avenue anticline indicates the possibility of an additional accumulation north and east of present work. Some additional leasing has taken place within the past few weeks but no immediate drilling is in prospect. The outer limits of the deep zone have not yet been established, and if Lloyd Corp. completes a large flowing well it will lead to additional drilling.

COASTAL DISTRICT COMPLETIONS

Capitan District

Milburn & Hamilton 1 Rutherford 36-5n-31w
T.D. 1,858 ft. Abandoned in gray Vaqueros sand. Started as core hole but if conditions had warranted would have been converted into wildcat hole. Top Vaqueros 1,810 ft.

Cat Canyon Field

Union 11 Bell 27-9n-33w
Flowed 950 bbl., 16.3-gravity, 0.2 per cent cut. 1-in. bean. Pressures 250/400 lb. Elev. 1,122 ft. T.D. 5,800 ft. 7-in. oil string landed 5,798 ft. and cemented through perf. 5,318 ft. 100-mesh perf. open to production 5,325-5,800 ft. 5,000 ft. 2½-in. tubing. Santa Barbara County.

Coal Oil Point District

Bolsa Chico 191-7 Permit 25-4n-29w
T.D. 4,313 ft. Vaqueros and Sespe formations unproductive. Encountered reverse fault going through Vaqueros into Sespe for second time after finding a normal section. Abandoning. Ran into old pipe, plugged back and began again. Landed 600 ft. 11¾-in. casing. This well was being drilled from 100-ft. pier to be bottomed beneath Pacific Ocean by directional drilling. First well was drilled by Bolsa Chica and showed good odor in Vaqueros but nothing in Sespe. Later another operator took over and whipstocked out into the ocean without success. A second attempt was made by whipstocking beneath the uplands but failed to find production. Santa Barbara County.

Newhall-Potrero Field

Barnsdall 14 R.S.F. 26-4n-17w
Flowed 390 bbl., 34.2-gravity, 0.6 per cent cut, 400,000 cu. ft. gas. 13/64-in. bean. Pressures 600/1,700 lb. Elev. 1,193 ft. T.D. 7,207 ft. 7-in. water string cemented 6,410 ft. 826 ft. 5-in. liner landed 7,205 ft. and cemented through perf. 6,978 ft. with 125 sacks cement. Perf. open to production 6,989-7,019 ft., 7,060-7,205 ft. 67 days total elapsed drilling time from spud to completion. Producing from Modelo of upper Miocene age. Los Angeles County.

Padre Canyon Field

C. C. M. O. 10-A Hobson 23-3n-24w
Flowed 152 bbl., 30.1-gravity, 25 per cent cut, 65,000 cu. ft. gas. 48/64-in. bean. Pressures 100/150 lb. Elev. 519 ft. T.D. 7,797 ft. 8⅝-in. water string cemented 7,181 ft. Gun perf. 6,635-85 ft., 6,690-6,720 ft., 7,070-7,145 ft. 648 ft. 6⅝-in. liner landed 7,796 ft. and cemented 7,796 ft. Perf. open to production 7,190-7,205 ft., 7,214-50 ft., 7,325-65 ft., 7,376-93 ft., 7,510-37 ft. 7,385 ft. 2½-in. tubing. Completed in Hobson zone. 116 days total elapsed drilling time from spud. Ventura County.

Santa Maria Valley Field

Union 2 Morrison 27-10n-34w
Pumped 125 bbl., 14.3-gravity, 3 per cent cut. Elev. 356 ft. T.D. 4,995 ft. 5¾-in. oil string landed 4,990 ft. and cemented through perf. 4,650 ft. Perf. open to production 4,654-4,990 ft. 4,640 ft. 2½-in. tubing. 26 days total elapsed drilling time from spud. Santa Barbara County.

Shiells Canyon Field

Santa Clara Pet. Co. 2-C 3-3n-19w
Pumped 75 bbl., 28.1-gravity, 7 per cent cut. Elev. 855 ft. T.D. 3,210 ft. 7-in. water string cemented 2,519 ft. 750 ft. 4¾-in. liner landed 3,210 ft. Perf. open to production 2,520-3,210 ft. 2,500 ft. 2½-in. tubing. 49 days total elapsed drilling time from spud. Ventura County.

COASTAL DISTRICT WILDCATS

Huasna District

Harvey Oil Corp. 1 Huasna 11-32s-14e
Drilling 4,191 ft. ahead in sand and fractured shale. Formation test 3,924-4,129 ft. showed small amount of oil. San Luis Obispo County.

Ventura Avenue District

Lloyd Corp. 5 Lloyd 24-4s-23w
T.D. 10,475 ft. in oil sand. Located extreme eastern end of Ventura Avenue anticline. Drilling being done by Drilling & Exploration Co. under supervision of Ralph B. Lloyd. Ventura County.

LOS ANGELES BASIN

Operators in the Dominguez field, following the example set by Kettleman Hills operators have begun reducing crude-oil production in an effort to enhance curtailment and within the next few days production of the Dominguez field should be fairly well in line. It is not likely that production of the district will be down to or below the field's allowance but the action taken should reduce the overage that has been charged against operators for the past 2 years. R. E. Havenstrite, recognizing the advantage accruing by reason of curtailment to any property located in close proximity to the edge of a structure, has reduced his production accordingly. The deep test being drilled in the Dominguez field by Union Oil Co. has been temporarily held up for the past several days at 10,010 ft. but an early recovery is anticipated. This well, 79 Callender, is about 2,000 ft. below the eighth Callender zone but has not yet found a ninth Callender zone. Deep drilling in the eastern end of the Dominguez structure has failed to find anything below the eighth Callender zone but due to faulting this does not condemn the central or western part of the field. No. 79 Callender has a string of 9⅝-in. casing cemented at 7,005 ft. and so is in a position to go to extreme depths to determine the status of the structure below 10,000 ft.

Wilmington

In view of the concerted move to reduce overproduction in as many California fields as possible it would seem likely that a general move would be in order to eliminate at least part of the overage charged against the Wilmington field shortly. There are approximately 900 wells in the Wilmington field at the present time and it does not require very much overage per well to chalk up a sizable amount for the field. Wilmington has been overproducing about 6,000 bbl. per day against an allotment of 74,477 bbl. daily. It may not be possible to eliminate this excess entirely but some improvement is possible. The Wilmington field has considerable production shut in by General Petroleum Corp., Union Pacific Railroad Co., Richfield Oil Corp., Long Beach Oil Development Co. and other operators who recognize the advisability of keeping daily production within bounds. This field, due to the unusually large penetration afforded wells below the Ranger zone, will show a long life. There has been considerable reconditioning work undertaken in the town-lot area during the past several months and it is interesting to note that most wells following gravel packing have shown substantial increases in production. Gravel packing is especially advantageous in the Wilmington field as this excludes the fine white sand that results in reduced production. The use of gravel packs in this field has been an important factor in the maintenance of the field's production.

East Coyote

Deep-zone development in the East Coyote field appears to have quieted down temporarily and will probably remain at its present level for some time to come. Union Oil Co. has reached a depth of 7,410 ft. in 2 Toussau but has not announced whether the Bartholomae zone at 6,800 ft. was barren or contained oil. The fact that the bit was carried below this zone indicates the possibility that the company may either have found the Bartholomae zone barren or unusually thick. No. 2 Toussau is located too close to other producing wells to have missed the zone entirely but at the same time

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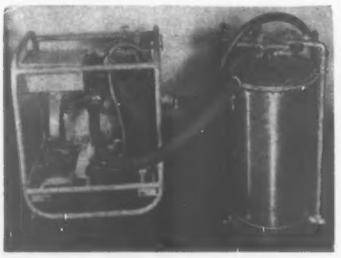

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this well may be located too far out on the structure to find the high saturation found in other wells. The Bartholomae zone, while proved up as productive over an area of about 100 acres, is not uniformly productive. The deep-zone discovery well was brought in as a pumping well but began flowing within a few days after completion and is still flowing naturally. Other wells in the general locality have required artificial stimulation.

LOS ANGELES BASIN COMPLETIONS

Brea Canyon Field

Shell 21 Orange 2-3s-10w
Pumped 306 bbl., 28.6-gravity, 1 per cent cut, 65,000 cu. ft. gas. Elev. 599 ft. T.D. 5,228 ft., P.B. 5,083 ft. 7-in. water string cemented 4,302 ft., 828 ft., 5½-in. liner landed 5,080 ft. Perf. open to production 4,308-4,549 ft., 4,569-5,010 ft., 5,030-80 ft., 4,494 ft. 2½-in. tubing, 55 days total elapsed drilling time. Orange County.

Dominguez Field

Union 80 Callender 29-3s-13w
Flowed 585 bbl., 30.1-gravity, 2 per cent cut, 1,000,000 cu. ft. gas. 32/64-in. bean. Pressures 500/750 lb. T.D. 7,414 ft. 5½-in. oil string landed 7,412 ft. and cemented through perf. 7,202 ft. Gun perf. with 308 holes, open to production 6,875-7,030 ft. 6,900 ft. 2½-in. tubing. Completed in eighth Callender zone of Miocene age. Los Angeles County.

East Coyote Field

Barth Oil Producers 1 Quetrel 20-3s-9w
Pumped 51 bbl., 17.2-gravity, 25 per cent cut. Elev 295 ft. T.D. 4,408 ft., P.B. 3,165 ft. 4¾-in. solid string landed and cemented 3,165 ft. Gun perf. 11 holes below 2,800 ft. 2,600 ft. 2½-in. tubing. 87 days total elapsed drilling time. Orange County.

Huntington Beach Field

Signal O. & G. 13 Bolsa 34-5s-11w
Flowed 853 bbl., 28.5-gravity, 0.2 per cent cut, 160,000 cu. ft. gas. 25/64-in. bean. Pressures 150/250 lb. Elev. 18 ft. T.D. 3,450 ft. 8⅝-in. water string cemented 3,023 ft. and through perf. 965 ft. 445 ft. 6⅝-in. lined landed 3,450 ft. Perf. open to production 3,049-3,450 ft. 3,304 ft. 2½-in. tubing. 13 days total elapsed drilling time from spud to completion. Orange County.

Rosecrans Field

Royalty Service Corp. 3-A-W 19-3s-13w
Flowed 610 bbl., 32.1-gravity, 1.5 per cent cut, 520,000 cu. ft. gas. 22/64-in. bean. Pressures 175/850 lb. Elev. 67 ft. T.D. 7,880 ft. 7-in. water string cemented 7,430 ft. 475 ft. 5½-in. liner landed 7,880 ft. Perf. open to production 7,430-7,880 ft. 7,840 ft. 2½-in. tubing. Completed in O'Dea zone. 36 days total elapsed drilling time from spud. Los Angeles County.

Wilmington Field

Coastline Oil Co. 1 Wilmington 32-4s-13w
Flowed 210 bbl., 16.7-gravity, 2 per cent cut, 10,000 cu. ft. gas. 1-in. bean. Pressures 125/125 lb. Elev. 40 ft. T.D. 3,710 ft., redrilled from 2,745 ft. 8⅝-in. water string cemented 2,730 ft. and also through perf. 1,000 ft. 1,000 ft. 5¾-in. liner landed 3,700 ft. Perf. open to production at various intervals. 3,688 ft. 2½-in. tubing with packer 2,965 ft. 38 days total redrilling time. Completed in Ranger zone. Los Angeles County.

Long Beach Oil Dev. Co. 17-W Harbor 3-5s-13w
Flowed 444 bbl., 28.5-gravity, 0.2 per cent cut, 340,000 cu. ft. gas. 25/64-in. bean. Tubing pressure 300 lb. Elev. 16 ft. T.D. 3,922 ft. 11¾-in. water string cemented 2,465 ft. 8⅝-in. oil string landed 3,915 ft. and cemented through perf. 3,222 ft. and 3,373 ft. Perf. open to production 3,222-3,353 ft., 3,373-3,505 ft., 3,526-3,674 ft., 3,695-3,795 ft., 3,815-3,915 ft. Interval 3,222-3,353 ft. is 10-in. O.D. gravel packed. 3,875 ft. 2½-in. tubing with packer at 3,361 ft. Producing from lower Terminal zone. Upper Terminal and Ranger zones shut in. This is tideland well and drilled by directional drilling. Los Angeles County.

Union Pacific R. R. 156 fee 4-5s-13w
Flowed 75 bbl., 30.1-gravity, 10 per cent cut, 50,000 cu. ft. gas. 32/64-in. bean. Pressures 100/900 lb. Elev. 15 ft. T.D. 5,485 ft. 10¾-in. water string cemented 2,637 ft. 2,624 ft. blank 7-in. liner landed and cemented 5,042 ft. and cemented through perf. 3,541 ft. 464 ft. 4¾-in. liner hung 5,479 ft. and cemented through perf. 5,270 ft. and 5,427 ft. Perf. open to production 5,042-5,140 ft., 5,272-5,335 ft., 5,429-79 ft., 5,010 ft. 2½-in. tubing. Producing from Ford zone. Ranger, upper Terminal and lower Terminal zones cased off with blank 7-in. liner. Located west end of field. 48 days total elapsed time from spud. Los Angeles County.

LOS ANGELES BASIN OUTPOSTS

Dominguez Field

Union 79 Callender 32-3s-13w
Drilling at 9,787 ft. Los Angeles County.

Long Beach Field

Union 19 L.B.C. 30-4s-12w
Drilling sand and shale 5,911 ft. Cemented 9⅝-in. casing 5,900 ft. Having trouble maintaining circulation. Los Angeles County.

LOS ANGELES BASIN WILDCATS

Dominguez-Gardena District

Wood-Mellon 1 Wood 31-3s-13w
T.D. 7,795 ft. P.B. 2,400 ft. Drilled ahead to seventh Callender zone at 6,975 ft., which was barren. Cemented 5½-in. casing 6,975 ft. Shot 2 holes at 6,764 ft. Formation test showed 2 bbl. salt water. Now acidizing. Building rig for second well. Los Angeles County.

Inglewood District

Standard 3-1 L.A.I. 17-2s-14w
Drilling 7,091 ft. in hard sandy shale. Los Angeles County.

Pico District

Cal-Pico 1 Pico 7-2s-11w
Drilling 7,755 ft. in sand and shale. Electrolog at 7,596 ft. showed well below 8-1 zone which is productive at Montebello. Los Angeles County.

Whittier District

Fullerton 6 Whittier 25-2s-11w
Drilling 6,060 ft. in sandy shale. Los Angeles County.

Southwest Texas Fields

(Continued from Page 79)

pressure, 90 ft. of oil-cut drilling mud and 450 ft. of salt water.

In the Weser field, Goliad County, W. R. Davis Co., Inc., is attempting to increase the flow in 1 Albrecht, recently completed through perforated casing at 5,246-52 ft. to open the first crude production in this gas field. Additional perforations were made at 5,240-52 ft. and the well was being tested at the close of the week.

In Duval County and in the east extension area of the Driscoll field, Continental 4-B Driscoll, B.S.&F. Survey, Section 483, cored oil sand at 2,567-77 ft. and casing is being cemented for completion after drilling to a total depth of 2,579 ft.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

De Witt County

Thomaston field: Atlantic 1 W. E. Conwell, perf. casing 7,918-22 ft., 41 bbl. oil plus 88 per cent salt water, ¼-in. choke, T.D. 9,950 ft.

Jim Wells County

Wade City field: Henshaw Bros. 4 Wendt, 72 bbl., 7/64-in. choke, perf. casing 4,785-87½ ft., T.D. 4,789 ft.
Magnolia 6 Schmidt, 97 bbl., ⅛-in. choke, perf. casing 4,912-14 ft., T.D. 4,916 ft.

Nueces County

Shield field: Shield Oil Co. et al 1 Allen, 153 bbl., distillate, 9 bbl. salt water, ¼-in. choke, perf. casing 6,970-74 ft., T.D. 7,810 ft.
South Clara Driscoll field: Magnolia 5 Johnson, 48 bbl., 3/32-in. choke, perf. casing 5,089-91 ft., T.D. 5,105 ft.
Navarro 4 Houser, dry, T.D. 6,638 ft.
Texas 4 Flynn, 2 bbl. distillate, perf. casing 3,670-80 ft., T.D. 5,015 ft.
Texas Conservative Oil Co. 5-B Flynn, 119 bbl., 11/64-in. choke, perf. casing 5,826-30 ft., T.D. 6,005 ft.
Stratton field: Bay-Tex Oil Corp. 5 Union Central Life, 71 bbl., ¼-in. choke, perf. casing 6,549-58 ft., T.D. 6,885 ft.
Corpus Christi Corp. 11 Wardner, 20 bbl. distillate, ⅛-in. choke. T.D. 6,538 ft.
S. E. W. Oil Corp. 1 Stelizig, dry, T.D. 7,015 ft.
Southern Minerals 2 Sellers, 86 bbl., 7/64-in. choke, perf. casing 6,445-61 ft., T.D. 6,690 ft.

Refugio County

Tomoconnor field: Quintana 17 Heard, 564 bbl., ¼-in. choke, perf. casing 5,854-62 ft., T.D. 5,925 ft.

Victoria County

Coleto Creek field: Glen H. McCarthy 1 Dietzel, dry gas well, perf. casing 3,565-87 ft., T.D. 5,403 ft.
Edwards field: Titanic 4 Edwards, dry, T.D. 6,012 ft.

Willacy County

Willamar field: Pan American Prod. Co. 1 Garcia, 263 bbl., ¼-in. choke, perf. casing 7,620-78 ft., T.D. 9,002 ft.

LAREDO DISTRICT

Brooks County

Kelsey field: Humble 76 McGill, 122 bbl., jetting. T.D. 4,749 ft.

Duval County

Casa Blanca field: Magnolia 5 Duval County Ranch Co., 48 bbl., ⅝-in. choke, T.D. 1,024 ft.
Magnolia 9 Duval County Ranch Co., 20 bbl., pumping, T.D. 1,047 ft.
Driscoll field: Continental 58-A Driscoll, 246 bbl., ¼-in. choke, perf. casing 3,290-3,304 ft., T.D. 3,305 ft.
Lundell field: Magnolia 18 Duval County Ranch Co., 35-bbl., jetting, sand 1,530-35 ft., T.D.
Peters field: Mills Bennett 1-B Peters, gas well, perf. casing 1,760-74 ft., T.D. 2,721 ft.
Seven Sisters field: Wellington 4-G Welder, gas well, perf. casing 3,069-75 ft., T.D. 3,076 ft.
Wildcat: Carter & Rubsamen 1 Clara Driscoll, dry, T.D. 2,890 ft.

Jim Hogg County

Manila field: Guy Davis 3 Zachry, 53 bbl., 3/32-in. choke, sand 2,590-95 ft., T.D.

La Salle County

Washburn field: H. R. Cullen 2 Washburn, dry, T.D 5,561 ft.

Live Oak County

Wildcat: J. P. Taylor 1 Federal Land Bank, dry, T.D 1,211 ft.

Webb County

Glen field: Interstate Minerals, Inc., 52 Lopez, 129 bbl., ¼-in. choke, sand 2,157-64 ft., T.D.

Zapata County

Lopeno field: A. E. Thompson 1 Ramirez, gas well T.D. 2,302 ft.

SAN ANTONIO DISTRICT

Caldwell County

Bee Creek field: Ralph Ogden 2-A Miears, 200 bbl. by heads, 5 per cent water, T.D. 2,196 ft.

Guadalupe County

Elm Creek field: Elm Creek Prod. Co. 5 Schraffl, 16 bbl., pumping, sand 770-805 ft., T.D.

Williamson County

Wildcat: H. G. Dickinson 2 Adamek, dry, T.D. 1,406 ft.

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EASTERN TEXAS FIELDS

Floods in Eastern Texas Slow Down Field Activity

By R. MARNE SANFORD

DALLAS, Tex., Dec. 2.—Flood waters raging down from swollen rivers in North and Central Texas considerably slowed and in some cases caused damage to oil-field work in eastern Texas, especially in the East Texas field.

Waters flooded the city of Kilgore and were reported to have damaged many of the numerous wells within the city limits. In many of the other fields throughout eastern Texas flood waters were reported to be hindering field work. In the East Texas field, as well as in the Central area, operators were obliged to hoist electric motors and gas pumping engines up into the derricks to avoid water damage. The flood waters were receding as the week closed and within a few days the extent of the damages will become known.

Meanwhile, general work for the week showed quite a slump over the week previous. Completions in the East Texas field dropped from eight the previous week to six the past week while locations remained steady at 11. In the East Central Texas field no new completions were reported for the week, the first time in many months and a very rare occurrence for the district.

Wood County

Definite location was staked the past week for the previously reported wildcat on the Haynesville dome north of Hawkins in Wood County. It is Delta Drilling Co. and Sells Petroleum Co. 1 Beckham, G. W. Cowan Survey, 4½ miles northeast of Mineola. It will seek production from the Woodbine sand, the same level found showing oil in the Manziel 1 Morrison, just north of Hawkins, several weeks ago. Meanwhile, 1 Morrison is still testing with no official gage yet reported. A successful shutoff of the salt water has not yet been obtained, even though the test has been plugged back and drilled out several times.

Chapel Hill Paluxy Test

Results are expected soon at Delta Drilling Co. 1 Browning, McDonald Survey, a Paluxy sand test on the north end of the Chapel Hill field of Smith County. The test was drilling ahead below 5,690 ft. and expecting the producing zone of the Paluxy at about 5,800 ft. The discovery well from the Paluxy sand in the field was completed from the 5,785-5,810-ft. zone. The test was last checked about 30 ft. low, geologically, on the top of the Georgetown lime, a definite marker for the area.

Rusk County Deep Test Planned

A deep 8,000-ft. wildcat has been planned in Rusk County for about 8 months, however, new plans were being worked the past week which indicate that the test may be started within the near future. Delta Drilling Co. is reported to have taken over the old block north of Henderson from T. P. Cannon and is planning to start the long-reported 1 Kangerga Brothers. The wildcat is expected to be in the R. Lane Survey.

Possible Ellis County Deep Test

Further information concerning eastward limits of the North Texas Fort Worth basin play may come as a result of a pending deep test in Ellis County. Gulf Oil Corp. is reported negotiating to purchase the wildcat and the block thereunder which W. E. Butler of Dallas drilled, 1 Sims, De la Rena Survey, 1 mile west of the town of Bristol. With an elevation of 485 ft., the test topped the Georgetown lime at 1,988 ft., Paluxy sand 2,654 ft., Glen Rose at 2,787 ft., anhydrite at 3,331 ft., and the Travis Peak at 3,770 ft. where it remains shut down. The Gulf plans, if successful in obtaining the test, carrying it to the Pennsylvanian formations which lie under the Cretaceous mantle in Ellis County.

EAST TEXAS FIELD COMPLETIONS

(One-hour gages)

Gregg County

Longview area: Coastal Dev. 8 Wood, 38 bbl., tubing, 3,519-33 ft.
The Pet. Co. 17 Colburn, 60 bbl., tubing, 3,511-97 ft.
Kilgore area: B. F. Carroll 3 Barker, 15 bbl., 3,543-67 ft.
Delta Drlg. Co. 5 Barber, 40 bbl., 3,401-3,500 ft.
Sinclair Prairie 26-B King est. No. 5, 50 bbl., 3,421-54 ft.
L. L. Sugar 2 Knowles, 20 bbl., 3,554-3,600 ft.

EASTERN TEXAS DRILLING REPORT

Anderson County

R. H. & W. Oil 1 Saunders, 17-acre tract in Joseph Ferguson Sur., in Frankston townsite, 5,000-ft. test, drilling 4,685 ft.
Tex-Harvey Oil 1 Cartmell, 63-acre tract in Blk. 4, E. Ewing Sur., 4 mi. E of Long Lake field, drilling 4,550 ft.

Fannin County

H. T. Fleming 1 Welch, E. J. Allen Sur., 4 mi. NW Honey Grove, reaming at 1,200 ft.
Damon Oil 1 A. L. Chaffin, SW cor. 85-acre tract, J. Ketcham Sur., 4 mi. NE Bonham, location cleared, prepare move in materials.

Freestone County

J. L. Collins 1 Utley, Claypool Sur., tested 5 bbl. oil then salt water broke in. S.D. 4,506 ft.

Henderson County

L. A. Demer 1 E. F. Bain, 104-acre tract in John Duncan Sur., 3½ mi. N of Bazzette, Woodbine test.

Hopkins County

L. A. Rankin 1 Chapman, Francis Hopkins Sur., preparing to deepen from 3,934 ft. to 6,000 ft., moving in rig.

Kaufman County

T. G. Shaw, trustee, 1 Agnes Wynne, B. S. Newman Sur., 8 mi. E of Kaufman, lower Trinity test, base Massive 6,255 ft., T.D. 6,454 ft., cleaning out to 5,000 ft., conditioning hole to resume drilling, cleaning out to 4,006 ft.

Lamar County

T. M. Parmly 1 C. H. Townsend, J. S. Porter Sur., 1½ mi. N of Chicolo, S.D. 1,550 ft.

Leon County

H. W. Hawker 1 C. H. Mills, M. Copeland Sur., 2½ mi. E of Normangee, S.D. 4,365 ft. (corrected depth).

Limestone County

Farrell Drlg. and Gulf Oil 1 F. Bevill, J. H. Murray Sur., 1 mi. SW of Horn, Travis Peak 4,892 ft., S.D. 4,937 ft., curing titles.

McLennan County

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, S.D. 360 ft.

Illinois Fields

(Continued from Page 77)

Glen Dean 2,489 ft., Golconda 2,660 ft., Cypress 2,674 ft., Cypress sand 2,679 ft., drilling 2,847 ft.

Washington County

John Pugh 1 Wynn.....NW SW SW 33-3s-1w
Spud.

White County

O. O. Borden 1 I. McCallister....NE SE NE 7-5s-14w
Aux Vases 2,842-65 ft., 2,887-2,911 ft., 10 ft. soft porous sand 2,893-2,910 ft., removable pipe 2,635-71 ft., waiting on cement.
J. T. Bradley 1 C. Randolph.....NE NE SE 32-6s-9e
1,000 gal. acid 3,113-19 ft., McClosky, testing.
Patton-Cary 1 Reeves heirs.....SW NW SE 28-3s-14w
Putting on pump.
French & Cotton 1 May Roy....S½ NW NW 30-3s-9e
Rlg.

Repressuring Considered at Schuler

A repressuring program for the Jones sand of the Schuler field, Union County, Arkansas, is again being considered by operators and engineers of the Arkansas Oil and Gas Commission. The Jones sand, a gas-drive reservoir producing in 146 wells, is allowed about 450,000 bbl. monthly. During the 3 years of its producing history, the reservoir pressure has declined from the original estimate of 3,520 lb. per sq. in. in September 1937, to 1,828 lb. per sq. in. as of September 1940, with the average gas-oil ratio at 2,442 cu. ft. per bbl. on the latter date. The need for repressuring is indicated by the rapid pressure dissipation and plans for such a program, previously dropped, are again being considered. No drilling has taken place in the field for several months. Gas for the repressuring program is available in the field from the Reynolds member of the Smackover lime, a deeper producing formation.

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JM Johns-Manville 420 ROTARY LINING

Major Development Rumored On Piceance Creek Structure

By T. R. INGRAM

DENVER, Colo., Dec. 2.—The Rocky Mountain area had 12 completions, of which 10 were oil wells, 1 gas, and 1 a dry hole. There were 10 new operations.

Rumors are current in Denver that Piceance Creek, in western Colorado, with 61,400 acres completely unitized and upon which are three gas wells, is subject of negotiations looking toward development.

Mountain Fuel Supply Co. 6-B Wilson, Hiawatha field, Colorado, was completed for 706,000 cu. ft. of gas.

Argo 3 Elliott, in Lance Creek, an old well deepened from the Sundance, made 60 bbl. an hour in the Leo sand. General Petroleum No. 57-16-S, in Cole Creek, pumped 160 bbl. initial from the Shannon sand. Continental 4 Northern Pacific, Frannie field, pumped 108 bbl. initial from the Tensleep.

Cut Bank had a good completion in the south end in Texas 7 State, which swabbed 368 bbl. the first 24 hours. Other Cut Bank completions were Texas 11 Tribal-122 for 39 bbl., Glacier Production 6 Miller and 3 Rigney, both small wells, and Glacier Production 4 Fuller for 190 bbl. Kevin-Sunburst had a 10-bbl. pumper in Kippen Oil & Gas 2 Solberg and a 16-bbl. pumper in H. F. Patterson 2 Government.

New operations include three in La Barge, one north of North Baxter Basin, a wildcat, four in Cut Bank, and two in Kevin-Sunburst.

SUMMARY OF COMPLETIONS

COLORADO

Fields—	No.	Prod.	Footage
Gas well	1	†0.7	4,007

WYOMING

Fields—	No.	Prod.	Footage
Oil wells	2	*268	7,720
Dry hole	1	.....	1,400
Total completions	3	.....	9,120
Recompletion	1	*900	.....

MONTANA

Oil wells	5	*614	12,589
Dry holes	1	.....	3,054
Total completions	6	.....	15,643

*Barrels. †Million cu. ft.

COLORADO

Inquiries received in Denver the past few weeks by dealers and representatives of manufacturers for quotations on pipe and gas pipe-line supplies without revealing the location of the proposed construction or identifying the interests behind it have aroused widespread speculation. Efforts made in several quarters to ascertain just what is behind the moves have yielded little success, but point to western Colorado as the most probable scene of action.

The rumors center around the Piceance Creek structure in Rio Blanco County on which Magnolia Petroleum Co. drilled three gas wells in 1929, 1931, and 1932. Since then no drilling activity has taken place for lack of a market for the gas. The current reports are to the effect that negotiations of some kind are now in progress which have for their objective the opening up of this reserve and piping gas to a number of towns and industries on the western slope. Just how far they have gone and what is involved has not been revealed in any official quarters, but the rumors are circulated among oil men who make it their business to keep informed on current developments.

The block of leases was originally assembled by A. C. Lighthall, of Denver, and Joe T. Juhan, of Glenwood Springs. The discovery well was drilled in 1929 in White Eagle Oil & Refining Co. 1-A Fordham, NW NW SW 9-2s-96w, jointly with the Magnolia company, to a total depth of 5,130 ft., and had a calculated open-flow capacity of 2,350,000 cu. ft. a day with a reservoir pressure of 764 lb. per sq. in. from zones at 2,655-57 ft. and 2,860-85 ft. The following year the area, which consists of government land, was unitized. This was not only one of the first unitized structures, but practically 100 per cent of lease, permit, and royalty owners were brought into the agreement. The unitized block consisted of 61,400 acres, including holdings of Magnolia, Midwest Refining, Snowden & McSweeney, E. P. Earl, and others. Magnolia was elected operator of the unit.

In 1931 the operator drilled 1 Maddock, C NW SE 9-2s-96w, to a total depth of 2,936 ft. and had a calculated open-flow capacity of 8,300,000 cu. ft. with a pressure of 820 lb. from a 12-ft. zone topped at 2,920 ft. The third well, 1 Titley, NW NW SW 15-2s-96w, was drilled in 1932 to 2,988 ft. and completed for 9,580,000 cu. ft. with a pressure of 842 lb. from a 38-ft. zone topped at 2,950 ft. This ended the development work. The drilling was entirely in the Green River and Wasatch formations of Tertiary age. Showings of oil were found in each well. It is estimated that 14,000 acres lie within the 250-ft. closing contour as worked out by surface geology.

Just how the working interests in the unit agreement are divided has never been made public, but it is understood that Magnolia's share represents 42 per cent of the whole and that lacking a controlling interest that company has not been anxious to undertake additional development. Mr. Juhan, who was active in organizing the unit and who holds a working interest as well as royalties, is reported to have been working on plans for opening the market for the gas. In order to assure a dependable reserve supply he recently started a wildcat on Webster Hill dome to the southeast of Piceance Creek with the expectation of reaching the productive horizon at a much shallower depth. This well is 1 Clough, C NW SE 22-6s-94w.

The present rumors became current with a report from Grand Junction saying that negotiations were under way to pipe gas to that city, a distance of 60 miles by air line south and west of Piceance Creek. That city lies in the Grand Valley in which is located a number of small cities and towns, a large fruit-growing district and the U. S. Grand Valley Reclamation Project. Another large potential market lies to the southeast and east, Glenwood Springs being the nearest. Farther east at Gilman in Eagle County is located Empire Zinc Co.'s Eagle mine, reputed to be the largest zinc mine in the world, but which produces large quantities of gold and silver. Natural gas at the mine would make possible the development of the zinc ores on a large scale. In the same general area is the Leadville mining district and Climax, where Climax Molybdenum Co. operates the largest molybdenum property in the world and from which is supplied from 80 to 90 per cent of the world's stock of molybdenum.

Public Service Co. of Colorado (Cities Service) operates the distributing system for manufactured gas in the Grand Valley district. A pipe-line system to the two general areas described probably would involve 150 to 200 miles of trunk lines.

Archuleta County

Kendrick Dev. Co. 1 fee.....SE NE SW 36-35n-2w
T.D. 865 ft., fishing for bit.
California-Colorado Oil 2 Macht NE SW NW 32-36n-1w
T.D. 1,081 ft., setting 10-in. to shut off thin water sand, small shows of gas in Mancos shale from 200 ft. to bottom.

Fremont County

U-Tex Oil 1 Hassler.....NE 28-20s-69w
Drilling 2,700 ft.

Garfield County

Joe T. Juhan 1 Clough.....C NW SE 22-6s-94w
S.D. 520 ft. in Wasatch, account of weather.

Las Animas County

H. G. Stevenson 1 Dutto-Marchiso....NW 32-33s-62w
Spudded to go to gas sand at around 1,800 ft.

Huerfano County

S. W. Pressey 4 Ojo.....NW NW NW 11-29s-69w
T.D. 670 ft., preparatory to P.B. to sand at 105-33 ft., where it tested 2 bbl. a day.
Tompkins & Son 3 Tompkins...SW SW SW 2-29s-69w
Standing at 1,165 ft., sand at 210 ft. tested 2 bbl. black oil a day.
Ira E. Miller 1 Hamilton.....SE SE NW 20-29s-67w
Drilling 1,830 ft.
R. L. Jewett 1 Valdez.....SE NE 30-28s-67w
T.D. 450 ft., running 12½-in. to set on top of sand at 440 ft. in which show of oil reported.

La Plata County

Nick Spatter 1-X Bryce.....SW SW 31-33n-9w
Cemented off caves at 4,390 ft.

Larimer County

E. P. Gallup 1 Hanson.....C SE NW 36-10n-71w
Drilling below 200 ft. in dry hole.

Logan County

West Plains 1 Sheldon.....SE NW SW 3-10n-55w
Drilling 3,240 ft.

Moffat County

Mountain Fuel Supply Co. 6-B Wilson, C NW SE 14-12n-100w, Hiawatha field, was completed at 3,550 ft. after plugging back from 4,007 ft. for 706,000 cu. ft. of gas a day from sand in Wasatch at 3,475-3,512 ft. through perforated 7-in. The location is 1 mile northeast of 5-A Wilson and 300 ft. south of the Wyoming line. It is not considered an extension of the gas area as it is on a higher contour than 1 Newberry, SE cor. 13-12n-100w, on the Wyoming side which was completed in 1929 for 30,000,000 cu. ft. in sand at 2,347 74 ft.

Park County

South Park Oil 1 Lamar.....NE NE SE 34-11s-75w
Drilling 7,571 ft. in Apache Creek sand.

Rio Blanco County

Texas-California 5 Unit.....NW NE NE 34-3n-94w
Cemented 13⅜-in. at 775 ft.
Raven O. & R. 31 Government SW NW NE 32-2n-102w
Drilling 1,200 ft.
Buford Oil 1 Government.....SW SW 16-1n-91w
T.D. 4,387 ft., landed 6⅝-in. at 4,200 ft., waiting on Haliburton to cement, will then bail down and test oil show.

WYOMING

A movement had been launched in Wyoming seeking to have President Roosevelt appoint Leslie A. Miller, secretary of the interior, to succeed Harold L. Ickes, who tenered his resignation immediately following the election on November 5. Mr. Miller is a Democrat and served as governor of Wyoming for the term ended in 1939. He has had extensive experience in the oil business as an operator and also in land matters, having served as land commissioner for that state. The movement also is receiving considerable support among oil men in Colorado who are desirous of having a western man appointed to the office.

Campbell County

Continental-Texas-Gulf 1.....NE SW SE 4-56n-69w
Spudded November 25, rotary test of Rocky Point structure.

Carbon County

Sinclair-Wyoming 16-A Wertz..SW SW SW 6-26n-89w
Drilling 4,437 ft.
Ohio 2 Lundy.....SE NE NW 34-20n-78w
Drilling 3,005 ft.
Sinclair-Wyoming 15-A Wertz...SW SW NE 7-26n-89w
Drilling 3,358 ft.

Crook County

Vickers-Continental 1 Duncan-Lobban.....
NE NW SW 28-57n-64w
S.D. 2,007 ft. in red shale.

Lincoln County

Klumpe Syndicate No. 1, SE SE SE 4-26n-113w, south flank of La Barge field, was dry at 1,400 ft.

Robert Miller Taylor, operator under the unit agreement on the Wyoming structure, has assigned his contract to K. M. P., Inc., of Salt Lake City, Utah, and new interests will deepen 1 State, Lot 1, 36-25½-115. The well is standing at 2,082 ft. Officers of the new company are Brigham Krause, president; Edwin A. Peay, Jr., vice president; and E. R. Miles, secretary treasurer, all of Salt Lake City.

Natrona County

While no official information has been released concerning results of the call for bids for the purchase of the Government's royalty oil from the Salt Creek field to be submitted to the secretary of the interior on November 15, private advices from Washington state that no bids were offered. A similar situation developed the past summer when a call for bids on royalty

(Continued on Page 89)

MICHIGAN OPERATIONS

Completions in Michigan at Lowest Point of Year

By OTTO C. PRESSPRICH

SAGINAW, Mich., Dec. 2.—Michigan operators expected an upturn in activity after the dullest week in the year, which brought only nine completions, of which only three produced oil while another was a sizeable gas well, giving confirmation to new development southwest of the Six Lakes field.

SUMMARY OF COMPLETIONS

Fields—	No.	Prod.	Footage
Oil wells	3	*177	7,446
Gas wells	1	†5.5	1,272
Dry holes	4	..	8,339
Total completions	8	.....	17,057

*Barrels. †Million cu. ft.

AVERAGE DAILY PRODUCTION

	Bbl.
Temple	10,032
Walker	7,691
Allegan County	7,674
Buckeye	2,683
Van Buren County	2,683
Wise	1,892
Adams	1,912
Michigan	46,358

While completions were at a minimum there was no letdown in permits, the state Conservation Department issuing 22 during the week to bring the year's total to 1,042. Van Buren County displaced Allegan as the site for most locations, six being listed while Allegan got three. Clare, Osceola, and Ottawa two each. One to a county went to Isabella, Gladwin, Kalkaska, Cass, Arenac, Bay, and Lenawee.

Fisher-McCall 1 Mackus in Ottawa's Georgetown Township, acidized for daily initial production of 144 bbl. of crude was regarded as of some importance, but another wildcat test in Ottawa's Robinson Township was a dry hole. The other production was a 13-bbl. completion in Mills Township of Ogemaw and a 20-bbl. well in Gladwin's Beaverton.

There were few developments of interest in the various drilling wildcat tests but Chartiers Oil Co. 1 Wagner, in Section 2 of North Shade, Gratiot County, only active test in the county, was well below 2,000 ft. and the same company's 1 Clark, Lakefield Township test in Saginaw County, was making good progress, being reported at below 1,500 ft.

The gas-well completion, Belvidere Oil Co. 1 Cornell, in Section 16, Belvidere Township, Montcalm County, rated 5,540,000 cu. ft. a day. It is ½ mile northeast of the Belvidere 1 Bradley gasser.

MICHIGAN COMPLETIONS

Arenac County

Adams Township: C. W. Teater 2 Rockafellow, NE SE NE 22-19n-3e, dry, T.D. 3,058 ft.

Gratiot County

North Star Township: V. R. Wilson and Twin Drilling Co. 1 Boyd, C NW, gas test, dry, T.D. 928 ft.

Gladwin County

Beaverton Township: Whitehill & Drury 3 Cingano, NE SW NE 36-17n-2w, 20 bbl., acid, T.D. 3,859 ft.
Bentley Township: Stork Oil Co. 1 Cady, N½ NW SE 35-17n-2e, location abandoned.

Huron County

Bloomfield Township: Gordon Oil Co. 1 Gainer, NW SW NE 28-17n-14e, dry, T.D. 2,670 ft.

Montcalm County

Belvidere Township: Belvidere Oil Co. 1 Cornell, SE SW SW 16-12n-7w, 5,540,000 cu. ft. gas, T.D. 1,272 ft.

Ogemaw County

Mills Township: T. F. Caldwell 10 State, NW SE NW 6-21n-3e, 13 bbl., acid, T.D. 2,611 ft.

Ottawa County

Georgetown Township: Fisher-McCall 1 Mackus, SE NE NW 2-8n-13w, 144 bbl., acid, T.D. 1,777 ft.
Robinson Township: Turner Petroleum Co. 1 Nebbelink, SW SE SW 24-7n-15w, dry, T.D. 1,683 ft.

Eastern Kentucky

(Continued from Page 82)

Isaac Brewer tract on Big Elk Creek in Martin County with the completed log in giving a daily flow of 189,000 cu. ft. of gas in Big lime and 499,000 cu. ft. in shale at a total depth of 2,824 ft.

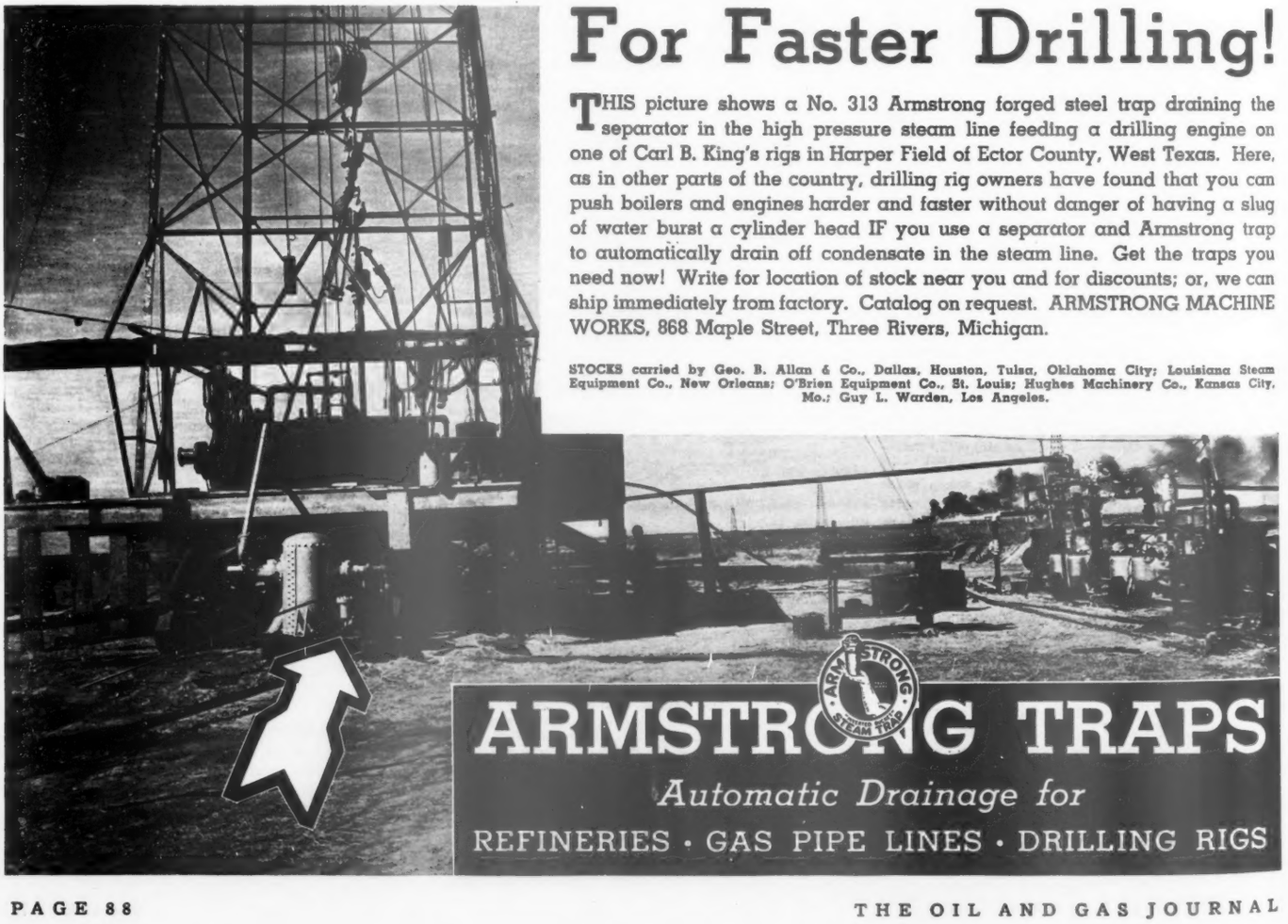
Columbian Fuel has abandoned No. 826 on the Tierney Land Co. tract No. 10 on Meathouse Branch in Pike County after reaching a total depth of 3,123 ft.

Jones & Lindsey hit a dry hole, P. P. & A., No. 1 on the Highland Coal & Land Co. tract on Levisa Fork in Floyd County after shooting Corniferous and acidizing Big lime.

Camp Burnett hit a dry hole in No. 1 on the Goldie Day on Devils Creek in the Torrent district in Wolfe County.

In Morgan County Fred Williams is reported to have completed No. 1 on the Rolla Dixon farm on the Pasture Creek with drilling through Big lime at a total depth of 668 ft. but production data are not available.

In Knott County the Kentucky-West Virginia Gas Co. is down 1,795 ft. in slate in 602 W. D. Hall on Joe King Branch and has reached a total depth of 2,449 ft. in 5115 J. L. Spurlock nearby. The same company is drilling at the 1,915-ft. level in 5278 William Slone on Caney Fork of Right Beaver Creek and has reached the 1,313-ft. level in slate shells in 5282 Benjamin Smith on Four Mile Branch of Jones Fork, and is idle at 5283 Joseph Hall nearby.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TURNER VALLEY COMPLETIONS

CHATHAM, Ont., Dec. 2.—North Turner Valley: Foothills Oil & Gas 5, LSD 13, 27-20-3w5, finished at 7,775 ft., showed 85 bbl. hourly flush, and after acidizing with 3,000 gal. in each porous zone increased to 300 bbl. an hour, settling to 141 bbl. The daily potential showed 3,384 bbl., and allowable is expected to be the largest in the field.

Home Oil 5, LSD 16, 28-20-3w5, finished at 8,078 ft., tested around 720 bbl. a day after partial acidization, and is being given further treatment.

West Central field: Okalta Oil 9, LSD 13, 18-19-2w5, finished at 7,971 ft., has been given temporarily allowable of 238 bbl. a day, pending rechecking of choke test and bottom-hole pressure. Calmont-Northwest 2, LSD 5, tested 2,304 bbl. a day on 1-inch choke with gas-oil ratio of 1,100 cu. ft. Allowable is expected to exceed 600 bbl. a day.

Arrow Royalties 2, LSD 15, 13-19-3w5, finished at 8,353 ft., produced 1,053 bbl. in 19 hours through tubing, later settling to around 35 bbl. an hour. It is testing for allowable. Twin Valley Syndicate 1, LSD 9, finished at 8,309 ft., is acidizing and testing. Open flow is estimated around 1,000 bbl. a day, before final acidization.

Allied Royalties 1, LSD 16, 6-19-2w5, flowed 35 bbl. an hour after final acid treatment in the lower porous zone, and is acidizing the upper zone.

Southwest field: Northwest-Hudson's Bay 4, LSD 14, 8-18-2w5, finished at 8,387 ft., is acidizing and testing.

Wells in the Lime

North Turner Valley: Home Oil 1, LSD 8, 33-20-3w5, entered the Madison lime at 7,202 ft., returned to the Fernie shales at 7,335 ft., and reentered the lime at 7,455 ft. It is deepening below 7,581 ft.

Foothills Oil & Gas 7, LSD 4, 27-20-3w5, is below 8,063 ft. after getting the Madison limestone at 7,980 ft.

West Central field: Pacific Petroleums 4, LSD 3, 32-18-2w5, is below 7,900 ft., after finishing a difficult fishing job. It got the lime at 7,529 ft.

Steveville Field

In the Steveville field, eastern Alberta, Anglo-Canadian Oil Co. 2, LSD 4, 14-20-11w4, has been shut down at 4,243 ft. The test was capped more than a year ago after getting a gas flow, estimated 11,000,000 cu. ft. a day, in the top of the Madison at 3,262 ft. Since October it has been deepened as a test of the underlying Devonian limestone. Standard of British Columbia 2 Princess, LSD 3, 13-20-12w4, now below 3,941 ft., is the only test in the field actively drilling.

Ram River Well

On the Clearwater structure in the northern Alberta foothills, Ram River Oils 2, 1-37-11w5, is below 1,785 ft., and nearing the black shale marker in the Devonian limestone. Production is expected a short distance below the marker.

Lloydminster Producer

In the Alberta end of the Lloydminster field, Shaw Petroleum 2, LSD 10, 25-49-1w4, which some time ago discontinued drilling in the oil sand at 1,771 ft., pulled rods and tubing when the well commenced to flow about 15 bbl. a day. Sanding has previously interfered with production on the pump.

Rocky Mountain Area

(Continued from Page 87)

oil from Lance Creek was issued. In the last-named instance the department made contractual arrangements for the sale of its crude. The royalty agreement in Salt Creek provides for the Government taking its oil in kind if it so elects. This it has done in the past. Sinclair-Wyoming Oil Co. having the contract for the 1940 production at a premium of 1 cent a barrel. It is understood that negotiations are pending looking to the Government taking its share in value instead of in kind beginning January 1, 1941. However, there have been recurring rumors to the effect that Canadian interests were in the market for the Government's royalty oil from Salt Creek, Lance Creek, and one or two other fields for export to Canada. The light-oil production in Salt Creek accruing to the Government amounted to 627,000 bbl. in 1939.

General Petroleum Corp. 57-16-S, NW SW SE 16-35n-77w, Cole Creek, was completed at 4,570 ft., total depth, and pumped 160 bbl. the first 24 hours from the Shannon sand at 4,535-70 ft. It is an outpost well on the north, but in what was considered proven territory. Its No. 37-22-P, which will mark a ¼-mile extension on the southeast, is a near completion.

General Pet. 37-22-P.....NW SE SW 22-35n-77w
T.D. 4,576 ft., cemented 7-in. at 4,541 ft., rigging up pump, Shannon saturated.
Royal Oil Corp. 1 Midert.....SW SW SW 26-35n-80w
T.D. 1,555 ft., running 8-in. to 1,400 ft.

Niobrara County

Lance Creek had one completion in Argo 3 Elliott, C NE NE 6-35n-65w, an old well deepened from 3,804 ft., where it was completed in 1935 in the Sundance for 2,400 bbl. initial. It was drilled to 5,316 ft. and made 60 bbl. an hour from three benches of the Leo at 4,960-5,250 ft. through 240 perforations in the 7-in.

Minnelusa Oil Corp. 4 Joss.....SW NE SW 6-35n-65w
Drilling 3,235 ft.
Continental 22 Tom Bell.....SE NW NW 34-36n-65w
Drilling 4,980 ft.
Continental 23 Tom Bell.....SE NW SW 34-36n-65w
Drilling 5,107 ft.
Ohio 18 Lamb-Acct. 2.....SE SW NE 5-35n-65w
Drilling 5,289 ft.

Park County

Continental Oil 4 Northern Pacific-1, SE NE SE 23-58n-98w, Frannie field, an inside well, made 108-bbl. average a day at 3,150 ft. on a pumping test from the Tensleep at 3,054-3,150 ft. after acidizing with 1,000 gal. It is a diagonal offset on the southwest to Kirk 3 Government which made 350 bbl. a day initial.

Continental 2 Northern Pacific NE NW NW 23-58n-98w
Drilling 2,680 ft. in shale.
Resolute 2 State.....SW SW 16-57n-101w
T.D. 10,121 ft., P.B. again to redrill Frontier sands.

Sublette County

Texas 1-C Government.....SW NW NW 24-27n-113w
Location, first report, La Barge field.
Texas 1-J Government.....NW SW SW 27-27n-114w
Location, first report.
Marvel Oil 6 Government....CEL SE SE 28-27n-113w
Rigging up, first report.
North La Barge Oil 6 Govt. CNL SE SE 28-27n-113w
Drilling 540 ft.
Texas 1-I Government.....SW NW SW 27-27n-113w
Drilling 1,000 ft.

Sweetwater County

Rocky Mountain Drilling Co. is moving in rotary for a test in SW SW SW 36-20n-104w, located 1¾ miles northwest of the nearest gas well in the North Baxter Basin district. The nearest producer is Mountain Fuel Supply Co. 1 Clark, NW SE SW 12-19n-104w, which was completed in 1939 at 3,392 ft. in the top of the Sundance sand for 2,840,000 cu. ft. of gas a day. There were rumors that the Clark well came in spraying oil. This was never officially confirmed. Last summer a report reached some of the Mountain Fuel Supply Co stockholders that plans were under way for an extensive exploration for oil in the Baxter Basin area. Again there was no confirmation, but in the meantime three wildcats have been drilled out on the flanks away from the gas area, but so far none of these have resulted in a discovery well. None of these are Mountain Fuel Supply operations. It was found in these tests, however, that the beds were in place and of normal thickness and porosity and this encouraged the belief that the chances still are favorable for oil in deeper horizons or around the flanks of the gas area. The district shows extensive faulting and the new test to the north is located in one of the fault zones. The eastern report last summer emphasized that one of the tests planned probably will go to 10,000 ft. Whether 1 State is being drilled as a part of the rumored plan is not known here.

Rocky Mountain Drilling 1 State.....SW SW SW 36-20n-104w
Moving in rotary, first report.
Sinclair-Wyoming 78.....SW SW NW 11-26n-90w
Drilling 4,167 ft.
Sinclair-Wyoming 97-A.....NW NW SW 11-26n-90w
Location.
Gus Pongratz et al 1 Clark.....NW NE 22-19n-104w
S.D. 5,005 ft., moving in heavier equipment, top red beds 4,955 ft.
Red Desert Corp. 1 Aspden..NW SW NW 34-18n-103w
Coring 6,236 ft., top dry hard Tensleep 6,158 ft.
Vermilion Oil 2 Government...SW SW SW 7-12n-99w
T.D. 3,535 ft., fishing.

Weston County

Osage Trust 1 fee.....NW NE 14-46n-63w
Spudded and S.D. to rig rotary.
Al Jones 1.....NE NE NE 1-46n-64w
Spudded.
Carl Kundy 5.....NE SW SW 29-46n-63w
Cemented 8¼-in. at 302 ft.
Riggs Oil 4 State.....CNL NE SE 16-46n-64w
Drilling below 2,400 ft., Wall Creek at 2,015-25 ft.
W. H. Connor 1 State.....NW SW NE 36-42n-61w
T.D. 982 ft., top Sundance 951 ft., 36 ft. oil in hole, will shoot and test.

MONTANA

Big Horn County

Massey Oil & Gas 1 Government. SE SW SE 11-2s-31e
Drilling 2,008 ft. in Dakota.

Blaine County

Cherry Ridge Synd. 1 Harbolt. NW NW SW 1-35n-20e
Landed 10-in. at 1,220 ft., for formation shutoff.

Garfield County

H. H. Schwartz, Jr., 1 Charles.....SE NW 21-15n-30e
S.D. 3,528 ft. in top Madison, will go to Devonian.

Glacier County

The best completion in Cut Bank and a record well in its area was Texas 7 State, C SE NW 16-32n-5w, which swabbed 368 bbl. the first 24 hours. It is located in the extreme southeastern part of the field and made from two to four times the initial production of other wells in this section or the section to the west. Total depth is 2,975 ft. The 7-in. was cemented at 2,934 ft. and the Cut Bank sand was at 2,925-73 ft., with the main pay at 2,963-73 ft.

Texas 11 Tribal-122, CWL NE NE 6-32n-5w, swabbed 39 bbl. the first 24 hours at 2,884 ft., total depth, from the Cut Bank sand at 2,842-78 ft., with the main pay at 2,869-79 ft. The Sunburst at 2,800-20 ft., had a good show of oil at 2,810-20 ft., which was cased off.

Glacier Production 6 Miller, C NE NE 30-35n-5w, was completed at 2,956 ft., but showed for a small well, the oil rising 400 ft. after standing 24 hours. It will be shot with 20 qt. at 2,946-53 ft. The Cut Bank was at 2,930-53 ft. and first show of oil was at 2,950 ft.

Glacier Production 4 Fuller, NE NE SE 17-33n-5w, swabbed 190 bbl. the first 24 hours at 2,959 ft., total depth, from the Cut Bank at 2,907-59 ft., with the main pay at 2,943-59 ft. There was a show of oil in the lower section of the Sunburst at 2,855-93 ft.

Glacier Production 3 Rigney, C SW NE 2-35n-6w, at the north end of the field in a spotted area which has yielded dry holes, big gas and some oil wells, proved a disappointment, at 3,054 ft., total depth, it had 125 ft. of oil in the hole, not enough for a swabbing test. The Cut Bank sand was at 3,010-48 ft.

Texas 8 State.....C NE SW 16-32n-5w
Rig on ground, first report.
Texas 6 fee.....660 ft. N of S¼ cor. 15-35n-6w
Rigging up rotary, first report.
Glacier Prod. 5 Simero.....C NW SE 6-33n-5w
Rig on ground, first report.
Glacier Prod. 8 State.....NW NW SW 16-33n-5w
Rig on ground, first report.
Steel Creek Oil 4 Carmen.....SW SW NE 19-34n-5w
Rig on ground (formerly R. C. Tarrant).
A. B. Cobb 2 Tribal-197.....SE SE NE 19-32n-5w
Cemented 10¾-in. at 542 ft., top Colorado 540 ft.
Consolidated Gas 1 Frary-Tribal NW NW SE 19-32n-5w
Rig.
Texas 9 State.....C NE NE 16-32n-5w
Drilling 825 ft., top Colorado 575 ft., 10¾-in. 698 ft.
Texas 6 Purdy.....NW SW SE 35-35n-6w
Skidded rig 10 ft. south, spudded new hole.
Kately, Agent, 3 Kramer.....NE SE NW 15-34n-6w
Cemented 10¾-in. at 563 ft., top Colorado 540 ft.
Texas 2 Kneale.....C NE NW 14-35n-6w
Drilling 865 ft., top Colorado 605 ft., 10¾-in. 630 ft.

Stillwater County

Texas 1 Unit.....SE NW 10-4s-19e
T.D. 7,116 ft., P.B. to 3,900 ft., testing Eagle sand.

Toole County

Kevin-Sunburst had two completions and two new operations. Kippen Oil & Gas 2 Solberg, CSL NW NE 20-35n-3w, pumped 10 bbl. of oil and 2 bbl. of water a day at 1,903 ft., total depth, from the contact at 1,890-1,903 ft. after acidizing with 500 gal.

H. F. Patterson 2 Government, SE SE SE 15-35n-3w, pumped 16 bbl. of oil and 160 bbl. of water a day at 1,850 ft. after plugging back from 1,868 ft. and acidizing with 500 gal. Contact was at 1,831-36 ft.

Twinfields Oil 3 Thompson...NW NW SE 28-35n-3w
Drilling 650 ft., first report.
S. T. Scotland 4 McNamor....CNL NE SW 29-35n-3w
Spudded, first report.
Morton O. & R. 9 Morton.....NW NW SE 13-34n-2w
T.D. 1,428 ft., contact 1,410-28 ft., 400 ft. oil in hole, acidized with 500 gal.
Kevin Oil 4 Leach.....C SE NE 31-35n-3w
T.D. 1,640 ft., running 7-in.
C. L. Mills 2 Government.....SE NE SE 8-35n-2w
Drilling 1,330 ft.

NORTHWEST NEW MEXICO

McKinley County

Ambrosia Investors Co., Inc., 1 Govt. SE SE 11-14n-10w
T.D. 1,362 ft. in red limey shale, some water, 10-in. at 928 ft.

Rio Arriba County

E. B. McKenna 1 Government-Rath.....NW 29-26n-2e
Drilling 300 ft.

San Juan County

Red Cactus Oil 1 Tribal.....SE cor. 35-29n-18w
Drilling 850 ft.

San Miguel County

Southwest Drilling, Inc., 1 Conchas NW NE 34-17n-21e
Recementing 8¼-in. at 2,635 ft.

Torrance County

J. P. Stewart 1 Laman.....C NW NE 3-3n-12e
T.D. 541 ft., underreaming 10-in. for water shutoff.

UTAH

Box Elder County

Northern Oil 1.....NE SW 17-13n-4w
Resumed at 386 ft. and drilling ahead at 475 ft.

Summit County

Longwell Pet. Co. 1.....SE SW SE 35-3n-5e
Drilling 3,478 ft. in brown limy shale, small show gas with oil colors, 4¾-in. at 3,469 ft.

MISSISSIPPI AND SOUTHEAST

Mississippi Wildcats Fail To Find New Production

By GEORGE WEBER

JACKSON, Miss., Dec. 2.—More wildcat abandonments brought disappointment to Mississippi exploration during the past week, but two new tests in Bolivar and Noxubee counties began, and others were due to spud shortly. Tinsley, Mississippi's bright spot, continues to gain in importance, having passed the 100-well mark with reserve estimates and potential production rising weekly as edge operations prove additional production in the thick Woodruff sand section.

Core drilling and geophysical activity continue to hold attention in South Mississippi, southwestern Alabama and western Florida, but increased volume of operations to the east in Alabama and Florida have not offset the steady decline in activity in Mississippi.

Dry Holes

Attala County again failed to show production, as the Gulf 1 Peeler in 35-15-9, was abandoned at 5,027 ft. with no oil shows. The test was drilled into the Lower Cretaceous. In Warren County, Mississippi's fifth salt dome, discovered by Magnolia and Exchange 1 Paxton-Brown, southeast of the Glass dome, failed to show production possibilities, and the test was abandoned at 5,401 ft., 293 ft. in the salt.

A northwest outpost to the Pickens field, Joe Dawson 1 J. L. Wilson was abandoned after showing oil in a sand above the Wilburn producing zone of the field, but failing to bring in commercial oil production. The operator cored at 4,823-33 ft., recovering 10 ft. of gray glauconitic sand with a low porosity, good odor and spots of oil, but parts of the core showed a salty taste. A drill-stem test with the packer at 4,818 ft. showed recovery of 30 ft. of drilling mud with no shows in 10 minutes using ¼-in. chokes top and bottom.

The test was carried deeper to the Wilburn sand topped at 4,872 ft. In coring at 4,869-75 ft. a 7½-ft. recovery included 4½ ft. of shaly sand and 3 ft. of medium porous sand saturated with oil. One foot, cored at 4,875-76 ft., was a calcareous glauconitic sand bleeding oil at the time it was taken. A drill-stem test with packer set at 4,866 ft., and using ¼-in. chokes top and bottom, however, showed recovery of 390 ft. of fluid, consisting of 150 ft. of slightly oily mud, 60 ft. of oil and mud, 90 ft. of oily salt water and 90 ft. of salt water in 15 minutes. The Eutaw was topped at 4,812 ft. in this test.

SUMMARY OF COMPLETIONS

MISSISSIPPI

Fields—	No.	Prod.	Footage
Oil wells	2	*1,474	10,005
Gas wells	1	†35	2,465
Dry hole	1	.....	5,015
Wildcats—			
Dry holes	3	.....	17,705
Total	7	.....	35,190

*Barrels. †Million cu. ft.

DAILY PRODUCTION

	Bbl.
Tinsley	14,840
Pickens	1,145
Total	15,985

Tinsley

Completion of two additional wells during the past week brought the total of Tinsley producers to 102. Both wells, completed by Union Producing Co., were southeast extensions and both showed thick Woodruff sand sections and good initial production gages. No. 4 Childress had 84 ft. of Woodruff section, and 5 Robinette, 106 ft. of the Selma pay.

Jackson Completion

A good gas producer was brought in in the Jackson gas pool of Hinds County. Drilled by the city of Jackson in an effort to prove the contention that the pool is capable of furnishing gas to the city in a greater ratio than now drawn in the local distribution system, the well showed a potential of 35,000,000 cu. ft. of gas with shut-in pressure of 875 lb. Producing sand is in the top of the Selma at 2,457-65 ft.

MISSISSIPPI COMPLETIONS

Wildcat—Attala County

Gulf 1 S. J. Peeler, NE SE 35-15n-9e, T.D. 5,027 ft., dry, tops Selma 1,712 ft., Eutaw 2,520 ft., Tuscaloosa 3,060 ft., Lower Cretaceous 3,442 ft.

Jackson—Hinds County

City of Jackson 1 fee, cor. Adelle and Grayson Sts., 34-6s-1e, 35,000,000 cu. ft. gas, T.D. 2,465 ft., Selma gas sand 2,457-65 ft., top Selma 2,456 ft., shut-in pressure 875 lb., 5½-in. casing 2,456 ft.

Wildcat—Warren County

W. O. Allen 1 Tom Henry, W½ SW 4-7n-4w, T.D. 7,277 ft., dry.

Magnolia & Exchange 1 Paxton-Brown, C S½ S½ 12-14n-4e, T.D. salt 5,401 ft., dry, top salt 5,108 ft.

Pickens—Yazoo County

Joe Dawson 1 J. L. Wilson, SE SE SW 30-12n-3e, T.D. 5,015 ft., salt water

(Continued on Page 99)

SLUSH PUMP INSURANCE

. . . and the Premium Is the Price of a Nail!

The Abercrombie SHEAR-RELIEF Valve not only is the best insurance for pumps and pump parts . . . but the lowest cost insurance, too. It provides positive protection against blown up pumps and parts as well as protection against damage to itself. The common nail, which is sheared when the valve functions to relieve excess pressure, is the only damaged part.

Yes, it's easy to see why so many operators use the SHEAR-RELIEF Valve as standard equipment for pump insurance . . . when the premium is the price of a nail!

FLUID PISTON TRIPLEX PUMPS
ABERCROMBIE PUMP CO.
GULF BLDG. HOUSTON TEX.

SHEAR-RELIEF VALVE

PATTERSON-BALLAGH PROTECTORS

DRILLED 50,000 feet

—and good for many more wells

The above unretouched photo shows Patterson-Ballagh Protectors that have drilled five Texas wells a total of more than 50,000 feet and are still practically new. The original diameter (7¼") shows a loss of only 1/16" after drilling these five wells. The diameter of the tool joints is the same as before drilling, without a trace of contact. The original tool marks appear on the joints. Again, here is evidence of the long life of Patterson-Ballagh Protectors.

OTHER PATTERSON-BALLAGH PRODUCTS

MUD GUNS
WIRE LINE GUIDES
PIPE WIPERS
TUBING PROTECTORS
SUCKER ROD WIPERS
KELLY WIPERS
SWIVEL BAIL BUMPERS
WIRE LINE WIPERS

See Composite Catalog

PATTERSON-BALLAGH CORPORATION . Los Angeles . Houston . New York City

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1940 High	1940 Low	Week ended Nov. 30 High	Week ended Nov. 30 Low	Week ended Nov. 30 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1939	Com. sh. earn. 1938	1939 High	1939 Low	1938 High	1938 Low
58½	38½	51	49½	49½	Amerada Corp.	788,675	N.P.	50cQ	10-31-40	$2.00	$1.56	$2.07	74½	50	78	55
27⅛	18¼	24	22¾	22¾	Atlantic Refining	2,663,999	$25	25cQ	12-16-40	1.00	1.66	1.40	24⅝	18⅛	27⅜	17⅜
16⅝	8½	10⅛	9¼	10	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.25	1.39	—.85	21	10¼	23¾	12⅛
13⅜	7⅛	9⅝	9⅛	9⅛	Barnsdall Oil Co.	2,558,779	$5	15c	12-9-40	.90	.76	1.26	19½	11⅛	21⅜	10¼
8⅛	5½	6⅛	5⅞	6	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	11-15-40	.80	.55	.55	9⅞	6½	10¾	7
25	16⅛	20⅝	19¼	19½	Continental Oil of Delaware	4,682,572	$5	25cQ	12-23-40	1.00	1.35	1.10	31½	19⅞	35¾	21¼
6⅞	3⅜	4½	4¼	4½	Houston Oil	1,098,618	$25		10-17-30		.43	.83	9⅜	4½	9¾	5
14⅜	8	12¾	11½	11½	Lion Oil Refining	435,815	N.P.	25cQ	10-10-40	1.00	1.50	2.09	18⅛	10	25⅛	15⅝
17⅜	11½	14¼	13⅞	14	Mid-Continent Petroleum	1,857,912	$10	40c	12-2-40	.60	1.42	.56	18	11⅛	22⅝	12¼
11	7⅛	11¾	10¾	11¼	Mission Corporation	1,378,645	$10	25c	12-20-40	.65	.87	1.04	14⅞	8¾	17¾	10⅝
9¾	4⅝	7	6½	6½	National Supply	1,155,517	$10	....	12-22-37	....	—.87	—.79	15½	5⅝	23	12½
8¾	5⅜	7¼	6½	6⅞	Ohio Oil Co.	6,563,377	N.P.	25c	12-14-40	....	—.10	.25	10½	6	14⅞	8⅞
8¼	5½	8½	7⅝	7¾	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	.40	.81	1.22	11⅞	7	15⅞	10¼
10½	6¾	..	..	..	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	....	1.10	.08	8¾	5	9¼	6¼
41¾	27⅛	39⅞	38⅝	39⅝	Phillips Petroleum	4,449,052	N.P.	50cQ	11-30-40	2.00	2.21	2.03	46½	31¼	44⅜	27¼
22¾	15	18⅞	18¼	18¼	Plymouth Oil Co.	1,038,633	$5	25c‡	12-23-40	$1.40	2.38	2.59	24	17⅛	25⅜	15
11½	6¾	8⅛	7⅞	8⅛	Pure Oil Co.	3,982,031	N.P.	25c	12-20-40	.25	1.11	.38	11¾	6⅛	13½	8¼
9¼	6⅞	9¼	8⅞	9¼	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.65	.51	10¼	6⅝	9⅞	5
20	11	14⅜	14¼	14¼	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	12-14-40	1.00	1.40	1.52	24⅜	15½	27½	15½
13⅛	7⅝	10¼	9⅝	10¼	Shell Union Oil	13,070,625	N.P.	50c	12-20-40	.50	.77	.72	17¼	9⅞	18⅜	10
23¼	12¼	20¾	20⅛	20⅛	Skelly Oil	995,349	$15	50c	12-20-40	.75	1.99	2.27	29½	15½	34⅜	18½
12½	7⅛	9⅛	8¼	8⅝	Socony-Vacuum	31,206,071	$15	25cSA	9-16-40	.50	1.10	1.29	15⅛	10¼	16⅜	10⅝
26⅛	16¼	19⅛	17¾	17¾	Standard Oil of California	13,003,953	N.P.	25cQ	12-16-40	1.10	1.38	2.22	33⅝	24¼	34⅞	25⅛
29	20¾	27¼	25¼	26	Standard Oil (Indiana)	15,272,020	$25	50c†	12-16-40	1.25	2.23	1.82	30	22¾	35½	24¾
46½	29⅞	34⅞	33⅝	34⅜	Standard Oil of New Jersey	27,280,998	$25	75c†	12-16-40	1.25	3.26	2.86	53½	38	58⅜	39¾
65⅞	46¾	52	49¾	51½	Sun Oil	2,434,863	N.P.	25cQ	12-16-40	1.00	2.74	1.07	66	45¾	65⅛	45
2½	1⅛	1⅝	1½	1½	Superior Oil Corp.	1,388,979	$1	10c	12-28-38		.04	.24	3⅝	1¾	4¼	1¾
47⅝	33	38⅞	37⅝	38⅛	Texas Corp.	10,876,139	$25	50cQ	1-2-41	2.00	3.02	2.13	50¾	32½	49⅝	32⅝
4¼	2½	3¼	3	3⅛	Texas Gulf Producing Co.	888,146	N.P.	10c	12-14-40	.20	.69	.86	5¾	3¼	5⅞	2⅝
8⅝	5⅜	6½	6⅛	6¼	Texas Pacific Coal & Oil	888,236	$10	10c	12-2-40	.40	1.00	1.16	11⅜	7	12½	7
12	8¾	9⅞	9½	9⅝	Tide Water Associated	6,371,827	$10	15c	12-2-40	.80	1.05	1.28	14¼	9½	15¾	10⅛
17½	12	13½	13⅛	13⅛	Union Oil Co. of California	4,666,270	$25	25c	11-10-40	1.05	1.25	1.47	19¾	15⅛	22½	17⅛
29⅞	22¾	27¾	27¼	27¾	Union Tank Car Co.	1,177,381	N.P.	45c	12-2-40	1.30	2.07	1.16	24¼	20⅛	23½	20
3⅝	1¾	2	1⅞	1⅞	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.77	.52	4¼	2⅜	3½	1⅝

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. §Also 4 per cent in stock. ‖Also 2½ per cent in stock. ¶Also 1½ per cent in stock. —Deficit.

New York Curb Exchange

1940 High	1940 Low	Week ended Nov. 30 High	Week ended Nov. 30 Low	Week ended Nov. 30 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1939	Com. sh. earn. 1938	1939 High	1939 Low	1938 High	1938 Low
10¾	4½	5⅜	5¼	5¼	American Republics Corp.	1,308,049	$10	10c	7-11-38	....	$0.14	—.22	11¾	5½	11¾	5
3¼	1⅜	1⅞	1⅝	1¾	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.95	—.14	7¼	2½	10¼	4⅞
43	28	38	38	38	Buckeye Pipe Line Co.	200,000	$50	$1	12-14-40	$2.50	3.13	2.36	34¾	26½	39	22½
117	105	..	..	..	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	12-16-40	6.00	7.87	5.32	130	108⅝	128	97
6¾	4	6	5⅝	5¾	Cities Service (new)	3,703,978	$10	....	6-1-32	....	.68	.23	9¼	4¼	11	5⅛
2⅛	1/16	⅞	⅞	⅞	Cosden Petroleum	465,332	$1	....	.....	....	....	....	2¼	½	2⅜	⅞
24¼	11⅝	15	13	14	Creole Petroleum	6,974,356	$5	50cSA†	12-16-40	1.00	1.38	1.64	28	16¾	27½	17½
4⅜	2⅞	4	3⅞	3⅞	Darby Petroleum	351,390	$5	25cSA	1-15-39	.25	.03	.69	7⅛	3⅝	10¼	5½
2	1	1	1	1	Derby Oil & Refining	263,162	N.P.	....	.....	....	—.37	—.91	2⅝	1½	3½	1½
31	22	22½	22	22	Eureka Pipe Line	50,000	$50	50c	11-1-40	2.00	.63	—.37	23	15⅛	31	16
39⅞	25⅛	35⅛	33	34	Gulf Oil Corp.	9,076,202	$25	25cQ	10-1-40	2.00	1.69	1.43	45⅛	29¼	46⅞	33
68	47⅛	63¼	61½	63¼	Humble Oil & Refining	8,987,840	N.P.	62½c	12-26-40	2.00	3.33	3.98	71	52½	72⅝	56
12⅜	5½	7¼	6⅝	6¾	Imperial Oil of Canada	26,965,078	N.P.	25c	12-2-40	1.00	.71	.96	17	11⅜	19½	14⅛
7¾	3	3⅜	3⅜	3⅜	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	.50	.33	.47	7¼	5½	9⅜	6
19¾	8¼	10½	9⅞	9⅞	International Petroleum	14,324,088	N.P.	50c	12-2-40	1.75	1.19	1.98	27½	17	31¼	21
2¾	1⅝	1¾	1¾	1¾	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.06	.14	3⅜	2⅛	5	2⅛
10¾	7⅝	10	9⅝	9¾	Lone Star Gas	5,518,347	N.P.	30c	12-21-40	.70	.98	.88	10½	7⅛	10⅜	6⅝
6¼	3¾	4¾	4⅜	4⅜	Louisiana Land & Exp.	2,966,762	$1	5c	12-16-40	.35	.22	.45	7¾	4	9⅜	6½
17	9¼	10⅜	10⅜	10⅜	Margay Oil Corp.	149,943	N.P.	25cQ	10-10-40	1.00	1.52	2.28	17	14½	24	16
8½	6½	8	7½	7½	Midwest Oil Co.	998,474	$10	45c	12-16-40	.90	.99	.93	8¾	6⅝	9¾	6⅝
6¼	4⅞	5⅝	5½	5½	Mountain Producers	1,593,584	$10	30cSA	12-16-40	.60	.70	.62	6	4⅞	5¾	4½
13⅛	10	11½	11¼	11½	National Fuel Gas	3,810,183	N.P.	25cQ	10-15-40	1.00	.95	.84	14	11¼	14⅝	11½
12½	8¾	10¼	10	10	National Transit	509,000	$12.50	50c	12-16-40	.95	.91	.88	9½	7¼	9¼	6½
1¾	¾	..	..	..	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1¾	1	2⅝	1½
7⅝	5¼	..	..	..	New York Transit	100,000	$5	25c	9-20-40	.40	.88	.16	6	4	4½	3½
9⅞	6	..	..	..	Northern Pipe Line	120,000	$10	40c	12-2-40	.30	.31	.24	7	4½	6	4
5½	2½	3⅝	3¼	3¼	Pantepec Oil	2,856,872	$1	....	.....	....	....	....	7⅝	4	7⅜	3½
3¼	1¼	..	..	..	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.70	.17	5	1¼	4½	1⅝
2¾	1½	2⅞	2¾	2¾	Ryan Consolidated	298,931	N.P.	....	.....	....	.16	.29	3	1⅞	4	2⅛
11¾	4¾	..	..	..	Southern Pipe Line	100,000	$10	25c	9-3-40	.30	.25	—.27	4⅞	3½	5⅝	3¼
44	28	38¼	35¾	38¼	South Penn Oil	1,000,000	$25	$1.87½†	12-20-40	3.00	2.84	1.44	40½	26¾	39	28¾
35	21	23½	21½	21½	Southwest Penna. Pipe Lines	35,000	$50	50c	9-16-40	2.00	2.06	—.41	23	18	22¼	16½
20⅞	16½	20¼	19¼	19½	Standard Oil of Kentucky	2,604,790	$10	55c†	12-16-40	1.30	1.53	1.45	20½	17¼	18⅜	15
41¾	26¼	35¼	31¾	31¾	Standard Oil of Ohio	753,740	$25	25c	9-14-40	1.50	6.64	1.81	32¾	17	22⅝	16¼
2	1⅝	2	1⅝	1⅞	Sunray Oil	1,975,876	$1	5c	12-20-40	.10	.25	.23	2¾	1¾	3¼	2
3⅛	2	3	3	3	Texon Oil & Land	936,024	$2	10c	12-30-40	.10	.49	.56	4	2⅝	5¼	3½
3⅜	2	2⅛	2	2⅛	Transwestern Oil Co.	750,000	$10	....	.....	....	—1.42	.12	6	2½	5¼	2⅝
2⅛	1/16	1	1	1	United Gas Corp.	7,818,959	$1	....	.....	....	—.55	—.51	3⅜	1½	5¼	2⅝

†Includes extras. —Deficit.

Personal Paragraphs

N. N. JONES, petroleum engineer with Humble Oil & Refining Co., will present a paper entitled "Practical Use of Subsurface Measurements in the East Texas Field" at the East Texas chapter meeting of the A.P.I. December 10, in Kilgore.

C. L. FOLLMER, manager of the rate-research department of the Consolidated Gas Electric Light & Power Co., Baltimore, Md., has been appointed chairman of the rate committee of the American Gas Association. Mr. Fillmore will direct the important work of this committee which has devoted more than 20 years to study of all phases of rates and rate-making.

T. M. MARTIN, vice president of Lion Oil Refining Co., El Dorado, Ark., has been named committee member of the Division of Refining, A.P.I.

HARRY FOREMAN and L. H. ANDERSON of El Dorado, O. L. COLLINS of Smackover, E. C. SWAILS of Norphlet and GEORGE SNYDER of Oil City were honored guests at an "old timers" banquet given by the Texas Co. in El Dorado, Ark. The five retired employes, with other employes and officials of the company, heard L. G. HUGHES, assistant manager of the Arkansas-Louisiana division of the company, as principal speaker.

HOMER McDUFF, formerly with the Standard Oil Co. of Venezuela, has accepted the position of production superintendent with Southern Production Co., Inc., at Shreveport, La.

M. A. MACHRIS, vice president of Wilshire Oil Co., WALTER W. NORTON and FRED I. BARKIS have organized the Sea Shore Oil Co., preparatory to undertaking drilling operations in the Huntington Beach or Wilmington fields.

J. H. BAIRD, Lubri-Zol Sales Co., Cleveland, Ohio, will give a paper on "Engine Varnish as Influenced by Lubricating Oil" at the regular monthly meeting of the Ark-La-Tex chapter, W.P.R.A., in Shreveport, La., this week.

E. B. REESER, president of Barnsdall Oil Co., and R. A. BROOMFIELD, executive vice president, recently completed a tour of California fields including the Newhall-Potrero field which Barnsdall discovered a few years ago and which is undergoing conservative development.

JULIUS D. MADARAS, Detroit, Mich., spoke on the subject "Iron Ore Reduction by the Use of Natural Gas" at a meeting of the East Texas section, A.I.M.E., in Kilgore this week. R. W. WILSON, Baroid Well Logging Service, Houston, discussed well logging.

WILLIAM A. WHITE, of Petrolia, Ont., Canada, who recently returned from Peru, has left for Calgary, Alta., to join the staff of the Imperial Oil refinery.

J. W. SELBY, chief scout for Shell Oil Co., Inc., Houston, Tex., left last week for Real and Edwards counties in Southwest Texas for a 4-day hunting trip.

DR. W. E. WRATHER, consulting geologist of Dallas, Tex., addressed the Dallas Petroleum Geologists on Monday night, December 2, speaking on the role of minerals in international affairs.

ROBERT McMILLEN, production engineer, Gulf Production Co., will discuss pumping equipment for Michigan wells at the January 8 meeting of Michigan chapter, American Petroleum Institute, at Mount Pleasant.

DR. EUGENE A. STEPHENSON, head of the petroleum engineering department at the University of Kansas, Lawrence, has been elected chairman of the Petroleum Division of the American Institute of Mining and Metallurgical Engineering.

DR. LEO HORVITZ, with the Subterrex Co., Houston, Tex., addressed the weekly luncheon session of the Fort Worth Geological Society, Fort Worth, Tex., on Monday, December 2, speaking on geochemical well logging.

HARRY CONNELLY, president, and R. W. FORD, drilling superintendent for Peak Drilling Co., were in Parco, Wyo., last week from Wichita, Kans., making preparations for the drilling of a number of wells which the company has contracted.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Treasurer McAdoo would tax oil in order to obtain "preparedness" revenue. Senator Gore of Oklahoma opposes the McAdoo idea. "It would be levying tribute on the source of industrial power," says the senator.

Official figures show more than 2,100,000 cars licensed in the United States. The gasoline used in motor boating is also becoming a big factor in the gasoline trade. Development of motor boating in the past year or so has been more rapid than the early progress of automobiling.

Burkburnett is becoming increasingly active and the next few weeks should see at least 50 rigs busy in this district.

20 YEARS AGO

At Mineola, N. Y., on Thanksgiving Day, Lt. C. C. Mosley flew at a tremendous rate of speed and won out against a field of 34 starters. His pace was nearly 3 miles a minute.

Ryan Petroleum Co.'s Crockett County, Texas, test is reported at nearly 6,000 ft. This is the deepest well between the Mississippi and California.

Gasoline prices: Chicago tank-wagon price 27 cents, Tulsa service-station price 30 cents, kerosene 20 cents.

10 YEARS AGO

The Association of Railroad Executives demands legislation to divorce pipe lines from the oil industry, and to place pipe lines under control of the Interstate Commerce Commission.

It now looks as if the Joiner pool is of potential major importance as a well 1 mile west of the discovery is estimated good for from 500 to 1,000 bbl.

O. A. GRIFFEY, JR., of Murray-Griffey Drilling Co., has moved from Jackson, Miss., to Tulsa.

R. G. BRAY, of Union Oil Co., has been appointed manager of the company's Oleum, Calif., refinery, located in the San Francisco Bay region.

D. HAROLD BYRD, of Byrd & Frost, oil operators of Dallas, Tex., donated $1,000 to a fund to provide transportation of the Longhorn band of the University of Texas to make all football trips with the university's team.

R. B. KAHLE, president of Eastern States Petroleum Co., Houston, Tex.; B. F. FALLON, general manager for Eastern States, and M. E. BROOT, also of Houston, have been granted a charter for the Bowie Oil Producing Co., with offices in Houston.

DR. CARY R. WAGNER, chief chemist of the Pure Oil Co., will speak at the December meetings of the Department of Manufacture of the National Petroleum Association at Bradford, Pa., on December 11, Oil City on December 12, and Butler on December 13. He will discuss increasing the production of neutrals from Pennsylvania stocks.

B. A. RAY, geologist for Tide Water Associated Oil Co. in West Texas, Midland, has been elected president of the Midland Geological Society, succeeding P. D. MOORE, independent producer and geologist of Midland. R. L. BATES, of Texas Co., was named vice president, replacing W. G. MOXEY of Stanolind Oil & Gas Co.; W. LLOYD HASETIN, Magnolia Petroleum Co., was elected secretary-treasurer, succeeding HARVEY HERD, geologist for Standard Oil Co. of Texas.

F. S. BRADLEY, formerly stationed in Illinois, is now land man for Ohio Oil Co. in the Forest City basin area with headquarters in St. Joseph, Mo.

V. H. BORSODI, president of the Borsodi Petroleum Co., has moved the firm's headquarters from Houston, Tex., to the Milam Building in San Antonio, Tex.

JUDSON WOOD, vice president of the Mene Grande Oil Co., Maracaibo, Venezuela, sailed with his daughter, Miss Theresa Wood, from New York for Maracaibo last week.

W. S. S. RODGERS, president, and H. W. DODGE, vice president in charge of sales, of the Texas Corp., at New York, were business visitors to the company's offices at Houston, Tex., the past week.

E. P. PHILBRICK, district geologist for Magnolia Petroleum Co. in Kansas, is scheduled to return to his office in Wichita some time this week after being absent since August due to illness.

DR. W. L. RUSSELL, Tulsa, engineer with Well Surveys, Inc., delivered an address before the West Texas Geological Society Friday evening, November 28, in Midland, Tex. His subject was "Well Logging by Radioactivity."

K. C. LINDSEY, JESSE H. SHEPHERD, and GLEN STROUD, all of Cody, Wyo., have filed for a certificate of incorporation in Wyoming to form the Maverick Production Co. with plans for developing leases in the Maverick Springs field of Wyoming.

FLOYD E. HATFIELD, general production superintendent for the Gulf Oil Corp.'s Mene Grande Oil Co. in eastern Venezuela, delivered an address and showed several reels of film pertaining to South American fields before the Fort Worth Petroleum Engineers Club Friday evening, November 29.

44 Years With His Firm

Matthew B. Sweeney, chief of the southwest division for Sun Oil Co., and stationed in the company's Dallas, Tex., office, came up the hard way. He started as a roustabout in the fields of Ohio 44 years ago. The hard pull upward saw his promotion through almost every executive office of a large oil company.

MATTHEW B. SWEENEY

Mr. Sweeney was born in New York in 1871 and graduated from the Wellsville, N. Y., high school. During his 7 years in the fields of Ohio he received promotions to the title of district foreman. He was married in 1901 while in Ohio. In 1903 he went to Texas as district superintendent for the Sun Company's operations in the then thriving Spindletop field. Working in this capacity for 10 years he was, in 1913, again promoted, this time to the title of general manager for the Texas operations of the company.

In 1920, and after the Sun Oil Co. had located its southwestern office in Dallas, Tex., Mr. Sweeney was transferred to the Dallas office and promoted to head of the production department and general assistant to J. Edgar Pew, then head of the Dallas office. In 1930 Mr. Pew moved to Philadelphia, Pa., and John G. Pew became head of the Dallas office. Mr. Sweeney was again promoted, this time to his present position.

Mr. Sweeney is one of the three oldest employes of the Sun Oil Co. and is the next to the oldest member of the company to hold an executive position. He directs operations from his large office on the eighth floor of the First National Bank Building in Dallas. The Sweeneys have five children, three boys and two girls, all of whom are married. The hallway of their home in Dallas is decorated with pictures of their 13 grandchildren.

E. J. DOLEY, president, Doley Oil Co., is in Tulsa this week while on his return to Clayton, N. J., from Hays, Kans., where he has been directing the company's drilling operations in western Kansas.

FRANK WEST, of Texas Co., discussed "Equilibrium Constants for Light Hydrocarbons" at the last monthly meeting of the California Natural Gasoline Association held in Los Angeles.

W. E. SCOGINGS, of the Baxter Drilling Co., of Wyoming, and trustee of Selegna Oil Co. which has a number of producing wells in the Wilmington, California, field, has returned to Los Angeles from a business trip to Illinois.

K. S. ADAMS, president of Phillips Petroleum Co., Bartlesville, Okla., accompanied the Phillips 66 Oilers to New York last week where the National A.A.U. champions defeated the Ohrbach A.A. Metropolitan A.A.U. champions 37-35 in Madison Square Garden.

DR. C. E. NEEDHAM, president of the New Mexico School of Mines, at Socorro, N. M., and director of the New Mexico Bureau of Mines and Mineral Resources, gave a lecture on the Permian of central New Mexico November 23 before the West Texas Geological Society at Midland, Tex.

WALTER LEONARD, of Rowmor Corp. and Leonard Drilling Co., Mount Pleasant, Mich., is president of Monarch Development Co., a new company recently formed by a group of veteran Michigan operators. JOHN BRUMM, president of McClanahan Oil Co., Grayling, is vice president of the new company; B. M. JONES, of the Rowmor and Leonard companies, is treasurer; DON LEONARD, president of Leonard Drilling Co., is secretary; ARTHUR LEDBETTER, secretary-treasurer of McClanahan Oil Co., assistant secretary-treasurer; and FRED LOVEDAY, of Mount Pleasant, is general manager of Monarch.

T. A. CADY, formerly district scout for Continental Oil Co., has been promoted to head of the company's land department in Illinois and Indiana with offices in Evansville, Ind. Mr. Cady had been with the Kansas Corporation Commission.

Shifts: O. T. LAWHORN, geologist, Geophysical Service, Inc., from Levelland, Tex., to Alamogorda, N. M.; P. M. PETERS, engineer, Texas Co., from Saint Jo, Tex., to Nocona, Tex.; R. T. GERMAN, superintendent, Magnolia Petroleum Co., from Odessa, Tex., to Brownfield, Tex.; C. A. BENSON, engineer, Phillips Petroleum Co., from El Dorado, Ark., to Smackover, Ark.; JOE McMAHON, geologist, Benedum-Trees Oil Co., from Mount Vernon, Ill., to Decatur, Ill.; L. H. BOYD, geologist, Brown Geophysical Co., from Biloxi, Miss., to Vicksburg, Miss.; P. A. COLE, engineer, Cities Service Oil Co., from Russell, Kans., to Bartlesville, Okla.; C. F. SELLERS, geologist, Robert H. Ray, Inc., from Mobridge, S. D., to Bismarck, N. D.; MARK BOXELL, engineer, Phillips Petroleum Co. from Billings, Okla., to Phillips, Tex.

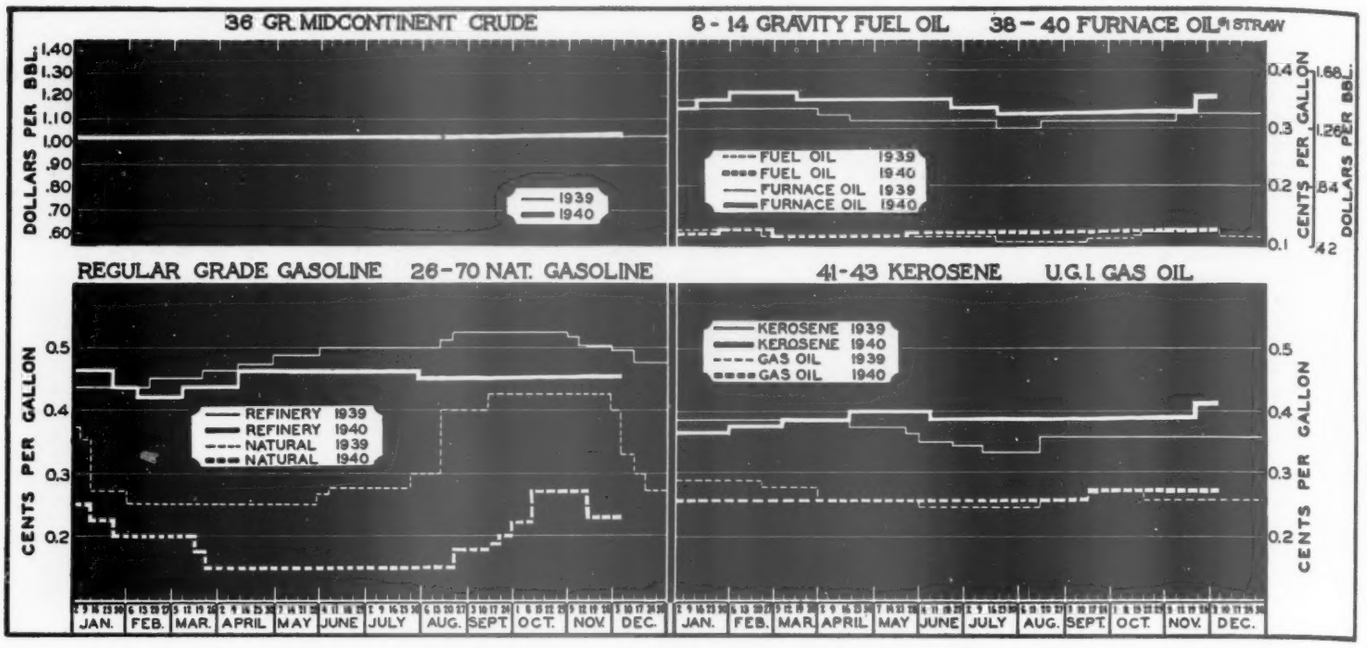
O. KIRKPATRICK, assistant drilling superintendent, British Controlled Oil Fields, Ltd., Maracaibo, Venezuela, has returned to his headquarters following a flying trip to Houston, Tex., and other points in the United States. Returning with him was his bride, whom he married during the trip.

R. E. HINES, who has been a member of the board of directors of the Independent Refiners Association for several years, has been elected president and will maintain offices in Los Angeles, Calif. At the same time, HENRY BROWN, B. E. DEVERE and L. W. FRANKLEY were elected to the board of directors. Directors reelected include J. H. LEWIS, C. B. LIMBOCKER and A. M. LOCKHART.

HERMAN B. DEMPSEY has been promoted to foreman of the Ballinger, Tex., pipe-line district of Lone Star Gas Co. He was formerly assistant foreman of the Ranger, Tex., district.

CAPT. HERMAN W. PONTIUS, of the U. S. Army Reserve Corps, who has been identified with the oil business in West Texas for 14 years, the last 8 of which he has been a resident of San Angelo, Tex., has left for Fort Monroe, Va., for at least 1 year's active military service. He has been associated with Ohio Oil Co.

MALCOLM MEEK, Abilene, Tex., was chairman of the arrangements committee in charge of the program for the annual meeting of the West Central Texas Oil and Gas Association, December 2, at Abilene. Other members of the committee included JOE A. CLARKE, president of the association; J. D. SANDEFER, JR., A. J. FRAZIER, J. C. WATSON, and D. F. MORRIS.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Higher Refinery Fuel-Oil Prices May Follow Jump in Tank-Wagon Market

By H. STANLEY NORMAN

ADVANCES of a quarter cent per gallon on most grades of light fuel oil in secondary markets this week may presage another increase in the tank-car market at sources of supply in the Mid-Continent. The quarter-cent advance in the Chicago tank-wagon market launched Monday by Standard Oil Co. (Indiana) follows by a week the tank-car price increase of an eighth cent by Group 3 refiners.

The jump raise in the tank-wagon market for fuels indicates that distributors anticipate another advance by refiners. Producers of fuel oil have been meeting an impressive increase in demand from buyers in the Middle West for the past 2 weeks. Temperatures have hovered around freezing in most of the North Central states since the first part of November. There was a lull after the first sharp impact of winter demand which developed simultaneously with an abnormally severe storm and record low temperatures a month ago. In the past week temperatures have hovered around the freezing point in most of the large fuel-consuming states resulting in a steady drain on stocks.

Refinery Prices Strong

Refinery prices for light fuel oil in the Group 3 territory, advanced an eighth a week ago to a spread of 3⅜ to 3⅞ cents, depending on specifications, are strong. Refiners report that the market is running counter to expectations to the extent that tank-car-price advances appear to have had no depressing influence on the inquiries from buyers. The feeling existed a week ago that more abundant refinery stocks attracted into the fuel-oil market by the tank-car advance might temporarily quench the enthusiasm of buyers. Results of the past week indicate, however, that interest of buyers in the light-fuel-oil market is even more active. Orders entering the spot market and the attempts of contract customers to buy in excess of maximum quantities combine to indicate the probability that another advance in tank-car prices may be expected in the near future.

Demand for motor fuel continues in excess of seasonal expectations but the availability of stocks keeps the market outlook in confusion. There has been no deep-seated weakness apparent in the Group 3 gasoline market for many weeks.

Refiners in the Group 3 territory report December gasoline business prospects to be holding along the lines of November, which was highly satisfactory for the operators of inland plants. Refiners in the Group 3 territory represent a relatively unimportant national position and recognize that less favorable conditions existing on the Gulf Coast preclude any possibility of price improvement for duration of the winter. The tank-wagon price advance of 0.3 cent per gallon in New York and New England states this week by Socony-Vacuum Oil Co., Inc., was a translation of the skyrocketing tanker rates applying to coastwise transfer of stocks from the primary Gulf market to North Atlantic terminals. Lacking the background of basic improvement, the East Coast market may settle back with a decline in tanker charter prices just as rapidly as it responded upward.

Refined Oil Market Barometer

Demand for distillate fuel oil this week continued to set new records for this season of the year despite the solid support given the tank-car price advance of an eighth cent per gallon. Resumption of natural-gasoline movement to the Gulf Coast indicated a revival of coastwise motor-fuel business which was extremely dull in the final half of November.

MID-CONTINENT: Refinery-gasoline movement is following routine lines at rates exceeding seasonal expectations.

GULF COAST: Coastwise movement of light and residual fuel oils is gaining momentum.

CALIFORNIA: Natural-gasoline trading has been more active this week due to cooler weather.

PENNSYLVANIA: Gasoline and lubricating oils are strong with the play on neutrals.

CHICAGO: Advances of a quarter-cent in tank-wagon prices for fuel were made Monday.

Gulf Influence Extensive

The Texas Gulf Coast refined market is in delicate condition. Dwindling exports, excessive stocks and the liberal production allowables only aggravate a set of marketing conditions there that have been generally unsatisfactory since the start of the European war. The Gulf Coast market structure is so soft that relatively strong conditions elsewhere cannot assert their significance on prices without attracting competition from coastal refiners.

Resumption of natural-gasoline buying for the account of Gulf Coast refiners alleviated the pressure that has existed on this market for the past 3 weeks. Prices for the 26-70 base material were reduced 0.5 cent in Texas and Oklahoma the second week in November and were under restraint until demand on the Gulf indicated this week that coastwise movement of winter-grade gasoline is again under way.

Shipments of gasoline from the Gulf to North Atlantic ports were held to a minimum during the latter part of November while buyers attempted to defeat the rising tanker charter market.

Eastern Fuel-Oil Price Advance Lags Behind Tanker-Rate Gain

By J. P. O'DONNELL

NEW YORK, Dec. 3.—The belief that the leveling off of tanker rates in mid-November was only temporary was sustained last week when rates in the Gulf-to-north-of-Hatteras run again advanced sharply. At the end of the week clean-tanker rates in coastwise service had advanced to 65 cents a barrel for gasoline, 70 cents for kerosene and 75 cents for No. 2 heating oil. The current 75-cent rate for No. 2 fuel oil is 3 cents above last year's peak and sets an all-time high for coastwise service.

The new peak was set by the chartering of the 4,221-ton tanker, Haygood, which was engaged for early January loading. The month-ahead chartering plus the fact that offerings for December loading are virtually nonexistent gives support to the prediction voiced by one large independent oil marketer that rates would reach $1 per barrel before the end of the season.

As late as Wednesday last week, the mixed tone that had been apparent in the tanker market for the better part of 2 weeks was still evident. At that time two charters were reported, both clean, at 60 cents and 52 cents, basis gasoline. Thursday the 3,845-ton Hadnot was reported chartered on the basis of 63 cents for gasoline, 67 cents for kerosene and 72 cents for No. 2 heating oil. The heating-oil rate equaled last winter's peak but the record was broken the following day with the chartering of the Haygood.

Whether or not the last rates will terminate the attempt to stabilize the tanker market remains to be determined. The recent low rates were reported to have been offered by major operators in the hope of ending the rapid rise in coastwise rates which have jumped clean tanker rates for No. 2 heating oil from an early season low of 21 cents to the present level of 75 cents, an advance of 54 cents, the equivalent of approximately 1.3 cents per gallon. One of the low-rate charters contracted last week is the 5,311-ton Olean which is scheduled for early February loading. The rates are 52 cents a barrel for gasoline, 55 cents for kerosene and 58 cents for No. 2 fuel oil.

The rise in tanker rates has apparently defeated the attempts of the refining industry to maintain a stable eastern heating-oil market this year by maintaining large supplies of fuel oil. No. 2 heating oil was quoted at 4.7 cents by a number of suppliers at the close of last week, an increase of 0.2 cent over the previous level. This is an increase of only 0.6 of a cent since early September, an increase which only reflects half the rise in tanker rates in the same period. If the tanker rate advance of approximately 1.3 cents per gallon was added to the New York harbor tank-car price, the latter would now be about 5.4 cents per gallon instead of the currently quoted 4.7 cents.

In addition to the tank-car rate in the New York Harbor, tank-wagon rates on fuel oil were also advanced in a large part of the eastern area. Standard Oil Co. of New Jersey advanced tank-wagon prices on Nos. 1, 2 and 3 grades of fuel oil at points throughout its territory. Advances were posted in the states of Delaware, Maryland, North Carolina, South Carolina and in the District of Columbia, the maximum being the 0.5 cent advance in No. 1 fuel oil in North Carolina.

Tank-wagon fuel-oil prices in this area now range from 7.5 cents at Baltimore to 10.05 cents at Spartanburg, S. C., for No. 1 fuel oil; from 6.75 cents at Charleston and Annapolis to 8.25 cents at Spartanburg for No. 2 fuel oil and No. 3 is quoted at 6.25 at Baltimore and 7 cents at Washington, D. C.

Kerosene also reflected the improved market conditions and the tank-car price in the New York Harbor area was generally quoted at from 5.3 cents to 5.5 cents, an advance of 0.2 cent on the low side. Kerosene tank-wagon prices were also advanced. Standard Oil Co. of New Jersey raised tank-wagon prices 0.5 cent throughout North Carolina, effective November 27, and Socony-Vacuum Oil Co., Inc., advanced prices from 0.2 to 0.7 cent throughout its New York and New England territory during the past week. On November 26 Socony-Vacuum Oil Co., Inc., made 0.2 cent advances effective in Buffalo and Rochester, N. Y., and on November 29 posted advances ranging from 0.2 cent in metropolitan New York and Syracuse to 0.7 cent in Manchester, N. H. The majority of the November 29 advances were 0.4 cent. Kerosene tank-wagon prices in the New York-New England area now range from 7.4 cents per gallon at New Haven to 9.2 cents at Manchester.

Gasoline also continued to show belated strength and Socony-Vacuum Oil Co., Inc., announced a bulk-plant advance of 0.3 cent a gallon throughout the New York-New England area with the exception of western New York and some unsettled areas. While much of the late strength in gasoline prices is attributed to the high coastwise transportation rates and to pretty well sustained demand, there has been a marked improvement of the statistical position of this product in the East Coast refining district.

The improved statistical position of gasoline on the East Coast is shown in the weekly American Petroleum Institute report on inventories. The report for the week ended November 23 shows that 561,000 bbl. were withdrawn from storage in that week and that this reduction brought stocks down to 17,587,000 bbl., which is more than 700,000 bbl. below the total on November 25, 1939. Thus from an early season position of approximately 2,000,000 bbl. above previous year's figures, the east coast district has improved its position to the point where a deficit one-third as great as the earlier excess exists.

An improvement in the export trade was shown

(Continued on Page 103)

Gulf Coast Markets

HOUSTON, Tex., Dec. 3.—Gulf Coast refinery market quotations were maintained the past week but lack of buying support is causing considerable uncertainty. Demand for Gulf Coast products on the Atlantic seaboard still is being held down by high tanker rates, the pressure of which is beginning to be felt in some quarters, particularly in fuels and burning oils.

As yet the strengthening in these products on the East Coast has not been sufficient to offset the advanced transportation costs, and during the past week there was growing speculation as to whether sufficient strengthening would come soon enough to forestall any giving in at the Gulf Coast end. Market observers are of the opinion that the market here is at its crisis; either the prices on the East Coast will have to be advanced soon or Gulf Coast markets will have to take up the difference. Gulf Coast refiners state they cannot afford to sell at any lower prices than now quoted and that they do not expect to make any concessions. Eighty cents still is the bottom for heavy fuels of Bunker C grade, while No. 2 fuel is not quoted under 3¼ cents as representative of the lighter fuels. There were reports of kerosene being offered below the generally quoted market, but this product has been firm and not much material has been available.

Speculation on the possibility of an early reduction in crude prices

(Continued on Page 103)

A.P.I. Weekly Refinery Statistics

Week Ended November 30, 1940

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	17,409,000	12,512,000	16,482,000	553,000
Appalachian	91.0	3,161,000	345,000	570,000	112,000
Ind., Ill., and Ky.	90.2	13,709,000	3,324,000	5,443,000	552,000
Okla., Kans., and Mo.	76.9	6,541,000	2,228,000	1,461,000	262,000
Inland Texas	59.6	1,647,000	1,542,000	409,000	112,000
Texas Gulf	89.2	12,563,000	8,465,000	8,702,000	852,000
Louisiana Gulf	97.6	2,520,000	2,128,000	1,448,000	118,000
N. Louisiana and Ark.	51.5	460,000	495,000	331,000	41,000
Rocky Mountains	56.0	929,000	431,000	139,000	51,000
California	87.3	15,815,000	73,328,000	10,227,000	520,000
Total reported	86.2	74,754,000	104,798,000	45,212,000	3,173,000
Est. unreported	.....	5,530,000	1,820,000	1,000,000	337,000
*Est. total	.....	80,284,000	106,618,000	46,212,000	3,510,000
*Est. total previous wk.	.....	80,100,000	106,871,000	47,511,000	3,510,000
*Dec. 1, 1939	.....	76,790,000	110,360,000	37,888,000	3,480,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended November 23, 1940	261,723,000 barrels
Week ended November 16, 1940	261,619,000 barrels
Week ended November 25, 1939	231,811,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of December 3, 1940

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Chicago, Ill.	14.6	13.6	4.5	10.0
Decatur	14.6	13.1	4.5	9.5
Joliet	15.6	14.1	4.5	10.0
Peoria	15.6	13.2	4.5	10.0
Quincy	15.4	13.9	4.5	9.8
Davenport, Ia.	15.6	14.1	4.5	‡10.0
Des Moines	15.4	13.9	4.5	‡9.8
Mason City	15.8	14.3	4.5	‡10.2
Duluth, Minn.	16.4	14.9	4.5	10.8
Mankato	16.0	14.5	4.5	9.0
Minneapolis	16.0	14.2	4.5	10.4
LaCrosse, Wis.	17.0	15.5	5.5	10.4
Green Bay	17.4	15.9	5.5	10.3
Milwaukee	16.8	15.3	5.5	10.2
Detroit, Mich.	14.1	12.6	4.5	7.6
Grand Rapids	14.3	12.8	4.5	9.1
Saginaw	14.9	13.4	4.5	9.1
Evansville, Ind.	16.6	15.1	5.5	†9.8
Indianapolis	16.8	14.8	5.5	†10.0
South Bend	16.8	15.3	5.5	†10.0
Fargo, N. D.	18.2	16.7	5.5	11.6
Huron, S. D.	17.5	16.0	5.5	10.9
Kans. City, Mo.*	14.8	11.8	4.5	8.0
St. Louis*	15.2	13.2	4.5	9.0
St. Joseph	14.7	13.0	4.5	7.9
Wichita, Kans.	13.8	12.3	4.5	7.0

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-790 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline			Kero.
	Cons'r tank wag.	Dir. vided	Incl. tax	tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
Atlantic City	11.00	12.60	4.5	7.9
Newark	11.00	12.60	4.5	7.9
Annapolis, Md.	12.85	14.35	5.5	9.5
Baltimore	12.25	13.75	5.5	8.5
Cumberland	13.65	15.15	5.5	10.0
Washington, D.C.	10.50	12.00	3.5	9.5
Danville, Va.	14.45	16.95	6.5	11.0
Norfolk	13.25	15.75	6.5	10.5
Petersburg	13.55	16.05	6.5	11.2
Richmond	13.55	16.05	6.5	10.5
Roanoke	14.75	17.25	6.5	11.0
Charles'n, W. Va.	14.05	16.55	6.5	12.6
Parkersburg	13.35	15.85	6.5	11.2
Wheeling	14.35	16.85	6.5	11.8
Charlotte, N. C.	16.40	15.00	7.5	10.3
Hickory	16.95	18.45	7.5	10.8
Mt. Airy	16.80	16.00	7.5	10.7
Raleigh	16.15	16.00	7.5	10.0
Salisbury	16.45	14.50	7.5	10.4
Charleston, S. C.	14.25	16.75	7.5	9.25
Columbia	15.10	17.60	7.5	11.5
Spartanburg	15.80	18.30	7.5	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline			Kero.
	Cons'r tank wag.	Net dlr.	incl. tax	tank wag.
Atlanta, Ga.	14.0	14.0	7.5	8.0
Augusta	16.5	16.5	7.5	9.5
Macon	15.0	15.0	7.5	9.0
Savannah	15.5	15.5	7.5	9.0
Birmingham, Ala.	16.5	16.5	8.5	9.0
Mobile	15.5	15.5	9.5	8.0
Montgomery	18.0	18.0	9.5	10.0
Jackson, Miss.	16.0	16.0	7.5	9.0
Vicksburg	15.5	15.5	7.5	8.5
Jacksonville, Fla.	16.0	16.0	8.5	8.0
Miami	16.0	16.0	8.5	8.0
Pensacola	17.0	17.0	9.5	8.0
Tampa	16.0	16.0	8.5	8.0
Lexington, Ky.	15.5	15.5	6.5	9.0
Covington	13.5	13.5	6.5	9.0
Louisville	15.0	15.0	6.5	8.5
Paducah	13.0	13.0	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
*Philadelphia, Pa.	12.5	13.5	5.5	10.0
Pittsburgh	13.0	15.0	5.5	10.5
Allentown	13.0	14.5	5.5	10.5
Erie	12.5	15.0	5.5	10.0
*Scranton	11.9	12.4	5.5	10.5
Altoona	13.0	15.0	5.5	10.5
Dover, Del.	...	14.0	5.5	10.5
Wilmington	...	13.5	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

*Voluntary discount of 1 cent allowed to dealers only.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline			Kero.
	Tank truck	Serv. sta.	Incl. tax	tank wag.
San Francisco	16.5	17.5	4.5	11.5
Los Angeles	16.0	17.0	4.5	10.0
Fresno, Calif.	17.5	18.5	4.5	12.5
Phoenix, Ariz.	20.5	21.5	6.5	*17.5
Reno, Nev.	19.5	20.5	5.5	13.5
Portland, Ore.	19.0	20.0	6.5	13.5
Seattle, Wash.	19.0	20.0	6.5	13.5
Spokane	20.5	21.5	6.5	16.5
Tacoma	19.0	20.0	6.5	13.5

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
Albany	12.0	13.0	5.5	8.0
*Met. New York, Manhat., Bronx, Queens, Brklyn., Staten Island	11.9	12.0	5.5	8.1
Buffalo	12.4	13.4	5.5	7.9
Rochester	12.8	13.4	5.5	8.5
Syracuse	12.5	11.2	5.5	8.9
Portland, Me.	11.4	11.7	5.5	8.4
Manchester, N.H.	12.5	12.6	5.5	9.2
Burlington, Vt.	12.5	12.3	5.5	8.6
Boston, Mass	10.4	11.4	4.5	8.4
Worcester	11.0	11.5	4.5	8.5
Hartford, Conn.	11.2	11.5	4.5	7.9
New Haven	10.9	11.1	4.5	7.4
Providence, R. I.	10.4	11.9	4.5	8.4

*Does not include 2 per cent city sales tax, which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline			Kero.
	Tank wag.		Incl. tax	tank wag.
Denver, Colo.	14.5	...	5.5	10.5
Grand Junction	16.5	...	5.5	12.5
Pueblo	15.5	...	5.5	9.0
Casper, Wyo.	16.5	...	5.5	11.5
Cheyenne	14.5	...	5.5	11.0
Billings, Mont.	16.5	...	6.5	12.0
Butte	15.5	...	6.5	13.0
Great Falls	15.5	...	6.5	12.0
Helena	15.5	...	6.5	12.5
Salt Lake, Utah	16.0	...	5.5	14.0
Boise, Idaho	†18.6	...	6.5	16.0
Twin Falls	†19.6	...	6.5	16.5
Albu'que, N. M.	*16.0	...	7.0	9.5
Roswell	*14.0	...	7.0	8.0
Santa Fe	‡17.0	...	7.5	9.5

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
New Orleans, La.	14.25	16.75	8.5	†11.0
Baton Rouge	14.75	17.25	8.5	‡10.5
Alexandria	14.75	17.25	8.5	‡10.5
Lafayette	15.00	17.50	8.5	‡10.0
Lake Charles	14.75	17.25	8.5	‡10.0
Shreveport	14.00	16.50	8.5	10.0
Knoxville, Tenn.	18.00	20.00	8.5	12.5
Memphis	16.00	18.00	8.5	11.0
Chattanooga	17.50	17.35	8.5	12.0
Nashville	17.00	17.50	8.5	11.0
Bristol	18.25	18.75	8.5	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

†Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline		Kero.
	Tank wag.	Incl. tax	tank wag.
Texarkana, Ark.	13.5	5.5	6.0
Fort Smith	13.5	5.5	6.5
Little Rock	16.0	8.0	8.0
Muskogee, Okla.	13.5	5.5	7.0
Oklahoma City	11.5	5.5	6.5
Tulsa	12.5	5.5	6.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Omaha	17.4	15.9	6.5	9.5
McCook	17.0	14.4	6.5	9.0
Norfolk	17.5	15.4	6.5	9.9
North Platte	17.8	15.5	6.5	10.2
Scottsbluff	17.4	14.5	6.5	10.8

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.0
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Gasoline		Kero.
	Tank wag.	Incl. tax	tank wag.
Halifax, N. S.	24.5	10.0	18.0
St. John, N. B.	24.5	10.0	18.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	24.5	8.0	17.0
Hamilton, Ont.	24.5	8.0	17.0
Winnipeg, Man.	27.5	7.0	22.5
Brandon, Man.	28.0	7.0	22.5
Regina, Sask.	25.0	7.0	20.0
Saskatoon, Sask.	28.0	7.0	23.0
Edmonton, Alta.	25.9	7.0	20.0
Calgary, Alta.	23.0	7.0	18.0
Vancouver, B. C.	21.0	7.0	23.0

Tank-Wagon Changes

Standard Oil Co. of Kentucky reduced consumer tank-wagon and net-dealer gasoline prices 0.5 cent per gallon on November 14 at Montgomery, Ala., and Pensacola, Fla., on November 15 at Vicksburg, Miss., and November 21 at Paducah, Ky.

Standard Oil Co. (Indiana) reduced the tank-wagon price of gasoline at Chicago 1 cent November 15 and reported a reduction of 0.2 cent at St. Louis, Mo., October 30. The company raised all fuel-oil prices 0.25 cent per gallon on December 2.

Standard Oil Co. of New Jersey increased the kerosene tank-wagon price 0.5 cent per gallon throughout North Carolina on November 27. Other light fuel oils were advanced 0.25 cent. The company advanced fuel-oil tank-wagon prices 0.25 cent generally throughout Delaware, Maryland and the District of Columbia November 26.

Atlantic Refining Co. instituted a special allowance of 1 cent to dealers at Philadelphia November 27.

(Continued on Page 99)

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of December 3, 1940

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04¾
63-66 octane	.04	.04¼
60 octane and below	.03¾	.04
60-62 400 grades:		
72-74 octane (regular)	.04½	.04¾
63-66 octane	.04¼	.04⅝
60 octane and below	.03¾	.04

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04¾
63-66 octane	.04	.04¼
60 octane and below	.03¾	.04
60-62 400	.03¾	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04¼	.04½
60 octane and below	.03⅞	.04⅛

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:	
72-74 octane (regular)	.04¾
60 octane and below	.04

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04⅛	.04½
60 octane and below	.03¾	.04⅛
60-62 400 grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04⅛	.04½
60 octane and below	.03¾	.04⅛

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)	.06
72-74 octane	.05¾

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher	.05½	.07¼
54-58 U. S. Motor	.04½	.06¼

EAST COAST (domestic)—

U. S. Motor grades:		
New York (Bayonne)*	.05	.06½
Philadelphia	.05½	.07
Boston		.05½
Baltimore	.05½	.07¼
Charleston, S. C.	.06½	.07

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
72-74 octane		.04
70-72 octane	.03⅜	.04
68-70 octane	.03¾	.04
65-67 octane	.03⅜	.04

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02¼
Grade 18-55	.02⅝	.02¾

NORTH TEXAS—

Grade 26-70	.02
Grade 18-55	.02⅝

CALIFORNIA—

75-85 375-390	.04½	.05¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70	.02

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03½	.03⅝
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03¾
46-48 gr., 210-230 i.b.p., 480-max., e.p.	.03⅞	.04

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.04	.04⅛
41-43	.03⅞	.04⅛

NORTH TEXAS—

41-43	.03⅞	.04

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.03⅞	.04

ARKANSAS (Ark. and N. La. del.)—

41-43	.04	.04¼

PENNSYLVANIA (inland refineries)—

46	.04⅞	.05⅛
45	.04⅞	.05⅛

CHICAGO (Based on Group 3)—

42-44	.04	.04¼
41-43	.03⅞	.04⅛

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04½	.05½

NEW YORK (Bayonne, N. J.)—

41-43	.053	.055

GULF COAST (domestic)*—

41-43	.03⅞	.04

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-42	.03⅝	.03¾
No. 1 straw, 38-40	.03½	.03⅝
No. 2 straw, 32-36	.03⅜	.03½
No. 3 zero to 10, 28-32	.03¼	.03⅜

NORTH TEXAS—

No. 1 prime white, 38-42	.03½	.03⅝
No. 1 straw, 38-40	.03⅜	.03½

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03¼	.03⅜

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.03¼	.03½

CHICAGO (Based on Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-40	.03⅝	.03¾
No. 2 straw, 32-36	.03½	.03⅝
No. 3, zero to 15, 28-32	.03⅜	.03½

NEW YORK (Bayonne, N. J.)—

*No. 1	.053	.055
*No. 2		.047
*No. 4	.045	.047

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.02⅞	.03⅛
No. 5, low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.50	.55

NORTH TEXAS—

U.G.I. gas oil, under 35	.02¾	.02⅞
No. 5 low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.50	.55

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02¾	.03
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 10-16	.50	.55

PENNSYLVANIA (inland refineries)—

36-40	.04½	.05

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.50	.75
10-17 (high sulfur)	.45	.65
San Joaquin Valley:		
10-18 (tank cars)	.50	.70
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.75	.80

GULF COAST—

No. 2 fuel	.03¼	.03½
43-47 diesel	.03¼	.03½
48-52 diesel	.03½	.03⅝
53-57 diesel	.03⅝	.03⅞
58-and-above diesel	.03⅞	.04
Diesel bunkers		1.50
Bunker C (bulk cargoes)		.80
Bunker C (bunkers)		.80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.046
28-30 diesel (lighterage 6¼c per bbl.)		1.85
28-30 diesel (tank cars)		.045
Bunker C (to ocean-going ships in N. Y. Harbor	1.15	1.25
Industrial fuel (tank cars)	.04	.046

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.18
150-160 D, 0-10		.13½
150-160 D, 10-25		.13
100-110 D, 0-10		.13
100-110 D, 10-25		.12½
Steam refined:		
600 dark green (untreated)		.07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.14½
15 pour point		.13½
25 pour point	.12	.13
Steam refined:		
600	.07	.07½
650	.08	.08½
600 flash	.09	.09½
630 flash	.11	.12

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:	
150-3	.08
180-3	.08½
200-3	.08½
250-3	.10
280-3	.10½
280-4	.10
300-3½	.11
350-3½	.11½
400-3½	.12
500-3½	.12½
600-3½	.13
100-2½ paraffin oil, 10-25	.05¼
10-25 pour point:	
200-3	.08
250-3	.09½
280-3	.10
280-4	.09½

GULF COAST—

Pale oils:		
100-3	.05¼	.05¼
200-3	.07⅞	.07⅞
300-3	.07½	.07⅝
500-3½	.08¼	.08½
750-3½	.08⅝	.08¾
1,200-3½	.08¾	.08⅞
2,000-4		.09
3,000-4		.10½
Red oils:		
200-5-6	.06⅞	.07
300-5-6	.07¼	.07½
500-5-6	.08	.08¼
750	.08⅜	.08½
1,200-5-6	.08½	.08⅝

CALIFORNIA (moving to dom. market)

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07½	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis., at 70° F., 3 color, 400-405 flash:	
Zero pour point	.22½
10 pour point	.21½
15 pour point	.20½
25 pour point	.19
200 vis., at 70° F., 3 color:	
Zero pour point	.24½
10 pour point	.23½
15 pour point	.22½
25 pour point	.21

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.02½	.03

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.02⅞	.03
124-126 (A.m.p.) w.c. scale	.02⅞	.03

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax		.0560
128-130 (A.m.p.) wax	.0560	.0570
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.	.02⅞	.03
124-126 (A.m.p.) y.s.	.02⅞	.03
Petrolatum in barrels, carload lots:		
Dark green	.02125	.02625
Amber	.02375	.02875
Extra amber	.02625	.03000
Lily white	.04375	.05125
Snow white	.05125	.06000
Cream	.03375	.04125

Export Prices

GASOLINE

GULF COAST—

U. S. Motor		.03⅝
60-62 400		.03⅝
61-63 390	.03⅞	.04
64-66 375	.03⅞	.04

LOS ANGELES—

U. S. Motor grades:		
Above 69 octane	.05½	.05⅝
65-69 octane	.05¼	.05½
60-65 octane	.04½	.05

KEROSENE

GULF COAST—

41-43 water white	.04	.04⅛

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbl.)—

Cylinder stocks:	
600 S.R. unfiltered	.16
630 S.R. unfiltered	.17
600 flash, S.R.	.18
650 flash, S.R.	.20
Bright stock:	
Light, 25 pour point	.20½

NEUTRAL OIL

200-3 color	.27
150-3 color	.25½

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p.		.05600
125-127 A.m.p.		.05600
128-130 A.m.p.		.05850
133-135 A.m.p.		.06150
135-137 A.m.p.		.06400
Crude scale:		
124-126 w.s.	.02⅞	.03
124-126 y.s.	.02⅞	.03

CRUDE-OIL PRICES...

Oklahoma, Kansas, North Central and East Central Texas

East Texas (Oct. 11, 1938)* $1.10
Sinclair Prairie Oil Marketing Co. October 2, 1939. De Soto Pipe Line October 2, 1939. Cities Service Co. October 5, 1939. Shell Oil, Inc., October 5, 1939.
Van, Tex. (Oct. 11, 1938)* $0.93
Talco, Tex. (Oct. 2, 1939)* ..... .65
Rodessa, Tex. .....
See North Louisiana gravity schedule
Cass and Panola counties, Texas . . .
See note below
Altus and Tipton† ..... See note below
Cayuga, Tex. (Oct. 2, 1939) $0.78
Clay Creek, Tex. ..... .85
Long Lake, Tex. (Jan. 20, 1940) ... 1.08

*Humble Oil & Refining Co. †Gulf Refining Co. Pure Oil Co.'s Van price, 93 cents, effective Oct. 13, 1938.

Cass and Panola counties, Texas, effective October 12, 1938, by Magnolia Petroleum Co., same as North Louisiana prices in Column 5 gravity schedule.

Altus and Tipton, Oklahoma, starting at below 25° at 71 cents, 2-cent spread to 40° and above at $1.03. Cayuga posted by Pan American Pipe Line Co. Clay Creek by Sun Oil Co. Long Lake by Sinclair Oil Marketing Co.

West Texas

See gravity table.
Fisher County, Texas (Apr. 1, 1939)
See note below
Pecos County (Oct. 11, 1938)* $0.78
Pecos shallow (Oct. 11, 1938)† ..... .65

*Shell Oil Co., Inc., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Oil Co., Inc.

Fisher County, Texas, by Shell Oil Co., Inc., below 25°, 68 cents; 25°, 70 cents, with 2-cent spread to 40° and over at $1.

NORTH LOUISIANA AND SOUTHERN ARKANSAS

(Posted by Standard Oil Co. of Louisiana, Stanolind Oil & Gas Co., Lion Oil Refining Co. and Arkansas Fuel Oil Co.)

(Effective 7 a.m. October 17, 1940)

	1	2	3	4	5
Below 21	$.55			$.75	$.91
21-21.9	.57			.77	.93
22-22.9	.59			.79	.95
23-23.9	.61			.81	.97
24-24.9	.63	$.73	$.83	.83	.99
25-25.9	.65	.75	.85	.85	1.01
26-26.9	.67	.77	.87	.87	1.03
27-27.9	.69	.79	.89	.89	1.05
28-28.9	.71	.81	.91	.91	1.07
29-29.9	.73	.83	.93	.93	1.09
30-30.9	.75	.85	.95	.95	1.11
31-31.9	.77	.87	.97	.97	1.13
32-32.9	.79	.89	.99	.99	1.15
33-33.9	.81	.91	1.01	1.01	1.17
34-34.9	.83	.93	1.03	1.03	1.19
35-35.9	.84	.94	1.04	1.04	1.20
36-36.9	.85	.95	1.05	1.05	1.21
37-37.9	.86	.96	1.06	1.06	1.22
38-38.9	.87	.97	1.07	1.07	1.23
39-39.9	.88	.98	1.08	1.08	1.24
40 and above	.89	.99	1.09	1.09	1.25

Column 1 applies to Atlanta, Buckner, Magnolia, Schuler (Jones sand and Reynolds lime) and Village fields.

Column 2 applies to Caddo, De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, El Dorado (West, South and Rainbow) and Schuler (Morgan sand).

Column 3 applies to Bunkie, Eola and Olla.

Column 4 applies to Bayou Des Glaise, Bayou Mallet, Choctaw, Darrow, Jeanerette, Lirette, North Crowley, Port Barre, Potash, Roanoke and St. Martinville.

Column 5 applies to University (Baton Rouge).

Big Creek, Dorcheat, McKamie distillates (sour) ..... $.95
Smackover (heavy)* ..... .73
Cotton Valley distillate 1.10
Cotton Valley crude 1.05
Cotton Valley (Holloway sand crude) 1.10
Rodessa, Shreveport (Cross Lake) .. 1.05
Schuler (Morgan sand), El Dorado and Rainbow 73-1.05
Tullos and Urania ..... .89
Lisbon, La. (Apr. 29, 1939) ..... .66-.82

Note—Stanolind purchases in Caddo Parish only.

*Smackover posted by Magnolia Petroleum Co., Oct. 12; by Gulf Refining Co., Oct. 13; McMillan Refining Co. and Cross Refining Co. met price. Tullos and Urania posted by Hunt Oil Co.

In the Lisbon, Louisiana, field, effective Sept. 14, 1939, Gulf Refining Co. and Caddo Crude Oil Purchasing Co. posted 27-27.9°, 66 cents, with 2 cents added for each degree up to 35 and over at 82 cents.

Gulf Coast

Seabreeze, Willow Slough, and LaBelle, Tex. (Sept. 14, 1938)***$1.10
Conroe, Tex. (Oct. 11, 1938)* 1.27
Black Bayou and White Castle, La. (Oct. 11, 1938)‡ ..... See note below
Gibson, La. (Oct. 11, 1938)† $1.04
Garden Island, La. (Oct. 12, 1938)‡ 1.24
Lafitte, La. (Oct. 12, 1938)‡ 1.04
Cleveland, Tex. (Oct. 12, 1938)† 1.14
Hardin, Tex. (Sept. 14, 1939)* 1.10
Tepetate, La. (Oct. 11, 1938)§ 1.03
Ville Platte, La. (Oct. 11, 1938)§ 1.03
Abbeville, La. (Jan. 1, 1939)§ .....
See note below
Bosco, La. (Dec. 3, 1938)‖ $0.93
Creole, La. (Oct. 13, 1938)‖ ..... .96
Gueydan, Sweet Lake, and Louise, La. (Oct. 13, 1938)‖ ....See note below
Vinton, Edgerly, Starks, Hackberry, Timbalier Bay, Quarantine Bay, and Grand Bay, La. (Oct. 2, 1939)**
Segno and Wing (Oct. 2, 1939)**
See note below
Happytown, La. (Jan. 12, 1940)† .. 1.00
Livingston (Oct. 11, 1938)† $1.10

*Humble Oil & Refining Co. †Shell Oil Co., Inc., ‡Texas Co. §Continental Oil Co. ‖Pure Oil Co. ¶Magnolia Petroleum Co. **Gulf Refining Co. ***Sun Oil Co. Hardin prices by Humble and Sun companies.

Black Bayou, etc., starts at below 20° at 79 cents; 20°-20.9°, 81 cents; 21°-21.9°, 83 cents; then a 3-cent spread to 26°-26.9°, 98 cents; then a 2-cent spread at 40° and over at $1.14. Abbeville starts at below 36°, 92 cents; 2-cent spread to 40° and over at $1.02. Gueydan, etc., starts below 20°, 79 cents, 3-cent spread to 26°-26.9° at $1, and 2-cent spread to 40° and over at $1.28. Segno and Wing take Gulf Refining Co.'s Gulf Coast prices. Vinton, Edgerly, etc., schedule starts at below 20°, 86 cents, 2-cent spread to 34° and above at $1.16. Shell Oil Co., Inc., withdrew as a purchaser in the Schwab-Wilcox area, Texas, on Apr. 8, 1940.

Hackberry, East and West, effective October 2, 1939, by Stanolind Oil & Gas Co. Below 20 gravity 86 cents, 2 cents added for each degree up to 34° and over at $1.16.

In the Bunkie and Eola pools in Louisiana, effective October 23, 1939, by Standard Oil Co. of Louisiana, below 25° 83 cents, 2 cents added for each degree up to 40° and over at $1.15.

Iowa, La., effective October 11, 1938, by Shell Petroleum Corp. and on April 1, 1939, by Shell Oil Co., Inc.: Below 18°, 75 cents; 18°-18.9°, 77 cents; 2-cent spread to 21°-21.9° at 83 cents; then a 3-cent spread to 26°-26.9° at 98 cents; then a 2-cent spread to 34° and above at $1.14.

Southwest Texas

Salt Creek, Darst Creek, Hilbig, Carroll, Clark and Zoboroski (Oct. 11, 1938)* $0.96
Pettus (Oct. 11, 1938)* 1.29
Flour Bluff (Dec. 3, 1938)* 1.23
Jim Wells County (Oct. 2, 1939)* ... 1.23
Darst Creek (Oct. 12, 1938)† ..... .96

Crude Prices by Gravities

Gravity—	Oklahoma and Kansas 1	Oklahoma and Kansas 2	Oklahoma and Kansas 3	North and Central Texas 4	Louisiana and Arkansas 5	East Central Texas 6	Gray County, Texas 7	Carson and Hutchinson Counties, Texas 8	West Texas, and Lea County, N. M. 9	Raccoon, Satsuma and Tomball, Texas 10	Gulf Coast 11	Anahuac, Dickinson, Texas 12	Refugio, Texas 13	Mirando-Duval, Beaumont-West Beaumont, Texas 14	Golden Meadow, Louisiana 15	Lockport, Iowa, Cameron Meadows, Louisiana 16	Gueydan, Vermillion Parish, Sweet Lake, Cameron Parish 17	Artesia, Jackson, Mallamar, N. M. 18
Below 18																$.74		
18-18.9									$.53							.76		
19-19.9									.53		$.86	$.81	$.91	$.86		.78		
20-20.9	$.70		$.60						.55		.88	.83	.93	.88		.80	.86	
21-21.9	.72		.63						.57		.90	.85	.95	.90		.82	.88	
22-22.9	.74		.66						.59	$.95	.92	.87	.97	.92		.85	.90	
23-23.9	.76		.69			$.78			.61	.97	.94	.89	.99	.94		.88	.92	
24-24.9	.78		.72	$.71	$.73	.80			.63	.99	.96	.91	1.01	.96	$.90	.91	.94	
Below 25																	.96	
25-25.9	.80	$.58	.75	.73	.75	.82			.65	1.01	.98	.93	1.03	.98	.90	.94	.98	
26-26.9	.82	.63	.78	.75	.77	.84			.67	1.03	1.00	.95	1.05	1.00	.90	.97	1.00	
27-27.9	.84	.68	.81	.77	.79	.86			.69	1.05	1.02	.97	1.07	1.02	.90	.99	1.02	
28-28.9	.86	.73	.84	.79	.81	.88	$.72	$.67	.71	1.07	1.04	.99	1.09	1.04	.90	1.01	1.04	$.61
29-29.9	.88	.78	.87	.81	.83	.90	.74	.69	.73	1.09	1.06	1.01	1.11	1.06	.90	1.03	1.06	.63
30-30.9	.90	.82	.90	.83	.85	.92	.76	.71	.75	1.11	1.08	1.03	1.13	1.08	.90	1.05	1.08	.65
31-31.9	.92	.86	.92	.85	.87	.94	.78	.73	.77	1.13	1.10	1.05	1.15	1.10	.92	1.07	1.10	.67
32-32.9	.94	.90	.94	.87	.89	.96	.80	.75	.79	1.15	1.12	1.07	1.17	1.12	.94	1.09	1.12	.69
33-33.9	.96	.96	.96	.89	.91	.98	.82	.77	.81	1.17	1.14	1.09	1.19	1.14	.96	1.11	1.14	.71
34-34.9	.98	.98	.98	.91	.93	1.00	.84	.79	.83	1.19	1.16	1.11	1.21	1.16	.98	1.13	1.16	.73
35-35.9	1.00	1.00	1.00	.93	.95	1.02	.86	.81	.85	1.21	1.18	1.13	1.23	1.18	1.00	....	1.18	.75
36-36.9	1.02	1.02	1.02	.95	.97	1.04	.88	.83	.87	1.23	1.20	1.15	1.25	1.20	1.02	....	1.20	.77
37-37.9	1.04	1.04	1.04	.97	.99	1.06	.90	.85	.89	1.25	1.22	1.17	1.27	1.22	1.04	....	1.22	.79
38-38.9	1.06	1.06	1.06	.99	1.01	1.08	.92	.87	.91	1.27	1.24	1.19	1.29	1.24	1.06	....	1.24	.81
39-39.9	1.08	1.08	1.08	1.01	1.03	1.10	.94	.89	.93	1.29	1.26	1.21	1.31	1.26	1.08	....	1.26	.83
40 and over	1.10	1.10	1.10	1.03	1.05	1.12	.96	.91	.95	1.31	1.28	1.23	1.33	1.28	1.10	....	1.28	.85

Column 1—Effective October 17, 1938, by Standard Oil Co. of Indiana. By Gulf Refining Co., October 13, 1938. Carter Oil Co. schedule and prices same from 30° upward, but on lower gravities pays below 21° 60 cents, with 3 cents added for each degree up to and including 29-29.9°, effective October 13, 1938. Gulf Oil Corp. starts at below 25° 78 cents, October 13, 1938. Texas Co. schedule starts at 28-28.9° at 86 cents. Pure Oil Co. same as Standard of Indiana's schedule, effective October 14, 1938.

Column 2—Sinclair Prairie Oil Marketing Co. February 16, 1939.

Column 3—Magnolia Petroleum Co. effective October 12, 1938; Shell Petroleum Corp., October 22, 1938; Shell Oil Co., Inc., April 1, 1939.

Column 4—Effective December 3, 1938, by Humble Oil & Refining Co. in Central Texas. By Magnolia Petroleum Co. in East Central and in North and Central Texas, excepting that it starts at below 29° at 79 cents, effective December 3, 1938. Texas Co. in North and Central Texas, same as Magnolia's but effective October 12, 1938. Gulf Refining Co. same as Magnolia's, effective October 13, 1938. Stanolind Oil Purchasing Co. in Cooke and Montague counties, schedule starts at below 21°, 60 cents, with a 2-cent spread upward to 40° and over at $1, effective October 17, 1938.

Column 5—Gulf Refining Co., October 13; Texas Co. October 12.

Column 6—Humble Oil & Refining Co., October 11, 1938.

Column 7—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude," beginning with 34-34.9°, at 84 cents, with 2-cent spread to 40° and over at 96 cents, and "Panhandle sour crude," 79 cents for 34-34.9°, with a top of 91 cents for 40° and over, effective October 12. Magnolia Petroleum Co. met Humble prices throughout, effective December 3. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents with a 2-cent spread, and a top price of 96 cents for 40° and above, and "Panhandle sour crude" below 29°, 67 cents, with a top of 91 cents for 40° and above effective October 13. Phillips Petroleum Co. schedule for sweet crude in Gray, Carson, and Hutchinson counties, starts at below 29°, 72 cents, with a spread of 2 cents up to 96 cents for 40° and over, effective February 7, 1939.

Column 8—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude" at 34-34.9°, 84 cents, with a top of 96 cents for 40 gravity, and "Panhandle sour crude" at 34-34.9°, 79 cents, with a top of 91 cents for 40° and over, effective October 12. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents, with a top of 96 cents for 40° and over and "Panhandle sour crude" at below 29°, 67 cents, with a top of 91 cents for 40° and above, effective October 13. Phillips Petroleum Co. schedule for sour crude in Carson, Moore, and Hutchinson counties, starts at below 29° at 67 cents, with a spread of 2 cents up to 91 cents for 40° and over, effective February 7, 1939.

Column 9—Humble Oil & Refining Co., effective October 11, 1938. Texas Co. schedule starts at below 26°, 65 cents, and ends at 36° and over at 87 cents, effective October 12. Gulf Refining Co. starts at below 26° at 65 cents and ends at 40° and over at 95 cents, effective October 13. Magnolia Petroleum Co. schedule starts below 25°, 63 cents, and ends at 40° and above at 95 cents, effective October 12. Sinclair Prairie Oil Marketing Co. schedule same as that of Magnolia, effective October 11, but revised on March 24, 1939, to stop at 36° and over at 87 cents. Stanolind Oil Purchasing Co. schedule same as that of Humble, effective October 11. Stanolind Oil & Gas Co. (Winkler County) starts at below 26°, 65 cents, with a 2-cent spread, and a top of 95 cents for 40° and above, effective October 11, 1938. Effective September 1, 1939, Shell Oil Co., Inc., posted Yoakum County crude, starting at below 20°, 53 cents, with 2 cents added for each degree up to 36° and over at 87 cents. Effective March 31 Atlantic Refining Co. added Gaines Cou ty to its price schedule.

Column 10—Humble Oil & Refining Co., effective October 11, 1938. Magnolia Petroleum Co., in Tomball, effective October 12.

Column 11—Effective October 2, 1939, by Humble Oil & Refining Co. in Texas Coast. By Sinclair Prairie Oil Marketing Co. in Texas Coast, October 3, 1939. By Texas Co. at $1.16 in Texas and Louisiana Coast, October 2, 1939, schedule stopping at 34° and over. By Sun Oil Co. in Texas and Louisiana Coast, October 2, 1939. By Gulf Refining Co. in Louisiana October 2, 1939, excepting that schedule stops at $1.16 for 34° and above. By Gulf Refining Co. in Texas, effective November 1, 1939.

Column 12—Effective by Humble Oil & Refining Co. October 2, 1939. By Sun Oil Co. in Anahuac, October 2, 1939. By Gulf Refining Co. in Anahuac, October 2, 1939. On November 1, 1939, Gulf Refining Co. applied these prices to Anahuac, Hull (New), Pierce Junction, Orange, Thompson (deep).

Column 13—Effective October 2, 1939, by Humble Oil & Refining Co. and Continental Oil Co. By Texas Co. up to 28° and over at $1.09 October 2, 1939. Atlantic adopted Humble price schedule November 7, 1939, in Refugio and applied it also to Greta.

Column 14—Effective October 2 by Humble Oil & Refining Co. By Sun Oil Co. in Mirando alone, stopping at 24-24.9° at 96 cents. By Stanolind Oil & Gas Co. in West Beaumont, alone, October 2, 1939. Gulf Refining Co. in West Beaumont, October 2, 1939. By Magnolia Petroleum Co. in Beaumont, October 2, 1939. By Texas Co. in Duval and Mirando, stopping at 28-28.9° at $1.09. Continental Oil Co. in Mirando and Duval, October 2, 1939.

Column 15—Effective October 2, 1939, by Texas Co.

Column 16—Magnolia Petroleum Co., effective October 12, 1938.

Column 17—Pure Oil Co., effective October 2, 1939.

Column 18—Continental Oil Co., effective October 11, 1938.

Darst Creek and Bruner (Oct. 13, 1938)‡ $0.96
Luling (Oct. 12, 1938)† ..... .87
Lytton Springs (Oct. 12, 1938)† ..... .99
Mirando (Oct. 12, 1938)† .....
Government Wells (Oct. 13, 1938) See note below

*Humble Oil & Refining Co. †Magnolia Petroleum Co. Pettus price adopted by Atlantic Crude Oil Purchasing Co. ‡Gulf Refining Co.

Government Wells posted by Sun Oil Co. starts at 20° at 77 cents, 3-cent spread to 24°-24.9° at 89 cents.

Middle Western States

OHIO OIL CO.
(Effective August 21 and 23, 1940)

Illinois old fields $1.00
Illinois basin 1.15
Illinois (Storms field) (Nov. 1, 1940)¶ 1.05
Princeton, Ind. 1.00
Western Kentucky (Aug. 21, 1940)† 1.10
Birk City, Ky. (June 9, 1939)¶ ..... .90
Corydon, Ky. (June 9, 1939) ..... .90
Greendale, Porter, Crystal and Wise, Mich. (Aug. 24, 1940)*‡ 1.12
Buckeye, Bentley, Edenville, Beaverton, Mich. (Aug. 24, 1940)* 1.10
Freeman-Redding, Mich. (Aug. 24, 1940)‡ 1.07
Arenac, Mich. (Aug. 24, 1940)* ..... .92
West Branch, Mich. (Aug. 24, 1940)* ..... .92
Allegan-Kent and Ottawa, Mich. (Aug. 25, 1940) 1.18
Bloomingdale and Columbia, Mich. (Nov. 1, 1940)¶ 1.18
Muskegon 1.00
Sherman and Freeman, Mich. (Aug. 25, 1940)‡ 1.07
Eastern Kentucky:
Big Sandy River (Aug. 21, 1940)† 1.12
Kentucky River (Aug. 21, 1940)† 1.20

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co. §Sohio Oil Co. Bloomingdale posted by Tri-Lakes Corp. Kent County by Naph-Sol Refining Co. On May 25, 1940, Sohio posted $1 per barrel in the Griffin field in Gibson County, Indiana, and Wabash County, Illinois, and the North Griffin, South Griffin, Phillipstown, New Harmony and Irons in Wabash and White counties, Illinois. Allegan, Kent and Ottawa posted by Commonwealth Pipe Line Co.

Rocky Mountain States

Dry Creek, Wyo. (Oct. 11, 1938)* $0.92
Elk Basin, Wyo. (Oct. 11, 1938)*† ..... .90
Grass Creek, light, Wyo. (Oct. 11, 1938)*† ..... .90
Grass Creek, heavy (Oct. 11, 1938)† ..... .40
Lance Creek, Wyo. (Oct. 11, 1938)* ..... .77
Rock Creek, Wyo. (Oct. 11, 1938)* 1.00
Iles, light, Colo. (Oct. 11, 1938)† ..... .98
Iles, heavy, Colo. (Oct. 11, 1938)† ..... .92
Dutton Creek, Wyo. (Oct. 11, 1938)† See note below
Frannie, light, Wyo. (Oct. 11, 1938)† $0.55
Frannie, heavy, Wyo. (Oct. 11, 1938)† ..... .42
Hamilton dome, Wyo. (Oct. 11, 1938)† ..... .35
See note below

Midway, Wyo. (Oct. 11, 1938)† .....
Salt Creek Tensleep Crude, Wyo. (Oct. 11, 1938)† $0.646
Salt Creek (Oct. 11, 1938) See note below
Canon City, Colo. (Oct. 11, 1938)‡ $0.90
Florence, Colo. (Oct. 11, 1938)‡ ..... .90
Cut Bank, Mont. (Jan. 1, 1940) 1.00
Kevin-Sunburst, Mont. (Jan. 1, 1940) ..... .80
Cat Creek, Mont. (Oct. 11, 1938)‡ 1.10
Big Muddy, Wyo. (Oct. 11, 1938)‡ ..... .98
Lance Creek, Wyo. (Oct. 11, 1938)‡ ..... .77
Lea County, New Mexico See West Texas gravity schedule‡
Artesia, Jackson and Maljamar See gravity table‡
Fort Collins and Wellington, Colo. See note below
Eddy County, New Mexico (Oct. 11, 1938)§ $0.77

*Ohio Oil Co. †Stanolind Oil & Gas Co. ‡Continental Oil Co. §Sinclair Prairie Oil Marketing Co.

Dutton Creek and Salt Creek Tensleep crudes start at below 29°, 86 cents, 2-cent spread up to 40° and over at $1.10. Salt Creek crude, excepting Tensleep, takes Standard Oil Co. of Indiana's Oklahoma-Kansas prices. Stanolind Oil & Gas Co., effective Oct. 11, discontinued posting prices in Greybull-Torchlight, Wyoming, and Hogback and Hospah, New Mexico. In Fort Collins and Wellington, Colorado, effective Oct. 11, 1938, by Continental Oil Co. 28-28.9°, 81 cents, with 2 cents added for each degree up to 40° and over at $1.05. Cut Bank and Kevin-Sunburst posted by Producers Refining Co.

Eastern States

SOUTH PENN OIL CO.
(Effective November 12, 1940)

Pennsylvania Grade oil in National Transit lines (Bradford field) ... $2.00
Pennsylvania Grade oil in Southwest Pennsylvania lines 1.65
Pennsylvania Grade oil in Eureka Pipe Line lines 1.59
Corning grade oil in Buckeye Pipe Line Co. line 1.12

TIDE WATER ASSOCIATED OIL CO. and NEW YORK TRANSIT CO.
(Effective November 12, 1940)

Bradford, Pa. $2.00
Allegany, N. Y. 2.00

PENNZOIL CO.
(Effective November 12, 1940)

Group A $1.93
Group B 1.92
Group C 1.91
Group D 1.90
Group E 1.88

PURE OIL CO.
(Effective August 28, 1940)

West Virginia $1.44

QUAKER STATE OIL REFINING CORP.
(Effective November 12, 1940)

Southern Ohio (Pa. Grade):
In Buckeye Pipe Line lines $1.55
In Eureka Pipe Line lines 1.59

Canada

ONTARIO
(Nov. 6, 1939, by Imperial Oil, Ltd.)

Petrolia $2.10
Oil Springs 2.07
Bothwell 2.10

TURNER VALLEY
(Sept. 12, 1940, by Imperial Oil, Ltd.)

Crude-oil price schedule starts at $1.08, for 33°-33.9°, including 2 cents for each degree gravity with top price for 64° and over 1.70
These prices f.o.b. producers' field tankage.

Mississippi and Southeast

(Continued from Page 90)

and abandoned, top Selma 3,946 ft., top Eutaw 4,812 ft., Wilburn sand 4,872-88 ft.

Tinsley—Yazoo County

Union 4 Childress, NE SW 19-10-3, 668 bbl., ¼-in. choke, C.P. 235 lb., T.P. 210 lb., Woodruff sand 4,876-4,960 ft., T.D. 5,000 ft., 7-in. casing 4,996 ft., perf. 4,875-4,915 ft.
Union and Magnolia 5 Robinette, SE NE 19-10-2, 816 bbl. ¼-in. choke, C.P. 230 lb., T.P. 195 lb., Woodruff sand 4,849-4,955 ft., T.D. 5,005 ft., 7-in. casing 4,999 ft., perf.. 4,860-90 ft.

MISSISSIPPI DRILLING REPORT

WILDCATS

Attala County

Jones & Crosby 1 J. F. Allen, SW SW 33-13n-5e, S.D. 4,534 ft.

Bolivar County

Ed Holmans 1 Thomas, 18-24-7w, first report.

Clarke County

Walsingham & Earles 1 School Land, SW NW NE 16-4n-15e, drilling 930 ft.

Forrest County

Fohs Oil Co. 1 Batson-Hatten, 10-1n-12w, lost circulation 2,000 ft.

Grenada County

James Papadakis 1 Holcomb, SE NE 13-22n-2e, drilling 3,806 ft.
Womble & Williams 1 Conn. Gen. Life Ins. Co., NW SE 28-23n-5e, S.D. 1,875 ft.

Kemper County

R. M. Crabb et al 1 Land, NW NE 12-10n-14e, reported show oil 1,750 ft.

Lee County

R. L. Shoemaker 1 Martin, SW SW NE 33-9s-6e, fishing 950 ft.

Montgomery County

W. O. Allen 1 Palmertree, SE SW 30-17-7e, moving in material.

Marshall County

C. B. Blosser 1 C. Stansback, SE SE 19-3s-4w, no report, last reported drilling 701 ft.

Noxubee County

Hope & Thompson 1 Donahoe, C NW 25-16n-17e, moving in material.

Prentiss County

Home Dev. Co. 1 Allen, SW NW SE 8-7s-9e, S.D. 2,165 ft.

Sharkey County

British American 1 Houston est., N½ NE SW 23-11n-7w, fishing 4,026 ft.

Yazoo County

Arcarea Reserve Co. 1 J. G. Holmes, SE SE 22-12n-1e, drilling 5,718 ft.

Alabama Prospect

In Madison County, Alabama, a shallow oil prospect is attracting interest. W. W. Newman 3 Nichols, 2-6s-2e, encountered sand at 244-50 ft. with a slight show of oil and lime at 260-69 ft. also showing some oil. A string of 6¼-in. casing was run to 242 ft. and the well bailed water. Operator will pull casing, rerun and test the wildcat next week.

ALABAMA DRILLING REPORT

Wildcat—Madison County

W. W. Newman 3 Nichols, NE NW NE 2-6s-2e, T.D. 274 ft., sand 244-50 ft., slight show oil, lime 260-69 ft., slight show oil, set 6¼-in. casing 242 ft., bailed water, will pull and rerun casing and test.

Tank-Wagon Changes

(Continued from Page 96)

Socony-Vacuum Oil Co. Inc., advanced the dealer tank-wagon price of gasoline 0.5 cent per gallon November 13 at Albany and reduced the price 0.5 cent at Syracuse, N. Y., the same day. The tank-wagon price at Portland, Me., was reduced 1.7 cents November 22 and a reduction of 0.5 cent was made November 20 at Worcester, Mass.

Socony-Vacuum advanced kerosene tank-wagon prices November 29 at the following points with amount of the increase following the city: Albany, 0.4 cent; metropolitan New York, 0.2; Syracuse, N. Y., 0.2; Portland, Me., 0.4; Manchester, N. H., 0.7; Burlington, Vt., 0.4; Boston and Worcester, Mass., 0.4; Hartford and New Haven, Conn., 0.4 and Providence, R. I., 0.4 cent. Kerosene tank-wagon prices were advanced 0.2 cent per gallon at Buffalo and Rochester, N. Y., November 26.

STANDARD OIL CO. OF CALIFORNIA

Crude-oil prices at the well effective February 1, 1940

(All gravities above those quoted take highest price offered in that field)

Gravity—	Signal Hill (Long Beach) (E. Segundo)	Wilmington	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley-Canal	Cole's Levee Richfield Western	Mountain View	Elk Hills	Buena Vista, Midway-Sunset, Lakeview	Lost Hills	Coalinga	Kettleman Hills
14-14.9	$.65	$.60	$.64	$.63	$.64	$.65	$.61	...	$.65	$.61	$.61	$.62	$.63	...	...	...	...	$.60	$.60	$.60	$.60	...
15-15.9	.65	.60	.64	.63	.64	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
16-16.9	.65	.60	.64	.63	.64	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
17-17.9	.65	.62	.64	.63	.68	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
18-18.9	.65	.64	.64	.63	.71	.65	.65	...	.68	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
19-19.9	.69	.69	.64	.67	.75	.70	.69	...	.72	.61	.65	.62	.63	...	...	...	$.60	.64	.64	.64	.61	...
20-20.9	.73	.73	.64	.72	.79	.76	.74	...	.75	.65	.69	.62	.67	...	...	...	.60	.69	.69	.69	.62	...
21-21.9	.78	.78	.64	.76	.82	.81	.78	...	.79	.69	.73	.62	.72	$.63	...	...	.64	.74	.74	.74	.66	...
22-22.9	.82	.82	.69	.81	.86	.86	.82	...	.82	.73	.77	.66	.76	.63	...	...	.68	.79	.79	.78	.70	...
23-23.9	.86	.86	.75	.85	.89	.92	.86	$.71	.86	.78	.82	.71	.81	.67	...	...	.71	.84	.84	.82	.74	...
24-24.9	.90	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	...	...	.75	.89	.89	.86	.78	...
25-25.9	.95	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	...	...	.79	.94	.94	.90	.82	...
26-26.9	.99	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	...	...	.83	.99	.99	.95		...
27-27.9	1.03	1.03	.97	1.03	1.04	...	1.03	.94	1.00	.94	.98	.89	.98	.87	$.83	$.92	.87	1.04	1.04	.99		...
28-28.9	1.07	1.07	1.02	1.07	1.07	f.o.b.	1.07	.99	1.03	.98		.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03		...
29-29.9	1.10	1.10	1.07	1.11	1.10	our	1.10	1.04	1.06	1.02		.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07		...
30-30.9	1.14	1.14	1.12	1.15	1.14	pipe	1.14	1.09	1.09			1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11		...
31-31.9					1.17	line	1.17	1.14				1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24			...
32-32.9					1.20		1.20	1.19				1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29			...
33-33.9								1.24				1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34			$1.12
34-34.9								1.29				1.20	1.26	1.19	1.10	1.16	1.14					1.17
35-35.9								1.34				1.24		1.23	1.14	1.20						1.21
36-36.9								1.39				1.28		1.27	1.18	1.23						1.25
37-37.9								1.44				1.33		1.31	1.22	1.26						1.29
38-38.9								1.49				1.37		1.36	1.25	1.30						1.33
39-39.9								1.54				1.42			1.29	1.34						1.38
40-40.9								1.59				1.46			1.33	1.37						...
41-41.9								...	...	...		1.50			1.37	1.40						...
42-42.9								...	...	...		1.54			1.41	1.44						...
43-43.9								...	...	...		1.59			1.45	1.47						...
44-44.9								...	...	...		1.63			1.49	1.51						...
45-45.9								...	...	...		1.67			1.53	1.54						...
46-46.9								...	...	...		1.71			1.57	1.57						...
47-47.9								...	...	...		...			1.61	...						...
48-48.9								...	...	...		...			1.64	...						...

For Newhall, McKittrick, Kern River, Round Mountain and Kern Front crude, Standard posts 60 cents per barrel for all grades. For Elwood Terrace crude (free on board ship), 33-33.9, $1.21, with 4 cents added for each degree up to and including 37° and over at $1.37; Wheeler Ridge crude, 19 to 21.9°, 60 cents; 22-22.9, 63 cents; 23-23.9, 67 cents; 24-24.9, 71 cents; 25° and over, 75 cents. On May 18, Union Oil Co. adopted Standard of California prices in all fields in which they both purchase.

EQUIPMENT PROGRESS...

New Leather Packings Developed by Auer

New special leather working-barrel cups, as well as new packings for compressors and pumps of every kind, all of which are based on an entirely new process in the manufacture of industrial leather specialties, have been developed and are now available from C. L. & W. W. Auer, Corry, Pa. Through the development of a new manufacturing method for leather packings and by employing a unique treating process, Auer special leather packings are doing an outstanding job in the most severe type of service. Kerosene, naphtha, gasoline, alkalies, solvents, acid solutions and water have been found to have but little effect on these new special packings.

Tests of these new items, in many cases, have shown double and even triple service over the ordinary type of leather working-barrel cups, commonly employed in oil production. This is due to the fact that strength is increased and resistance to wear is built up by the new process of manufacture. These new, special working-barrel cups and leather packings do not harden nor deteriorate with age. They retain their flexibility, expansion properties and all the qualities which make leather such an exceedingly fine basic material for these applications. When pumps are idle, cups will not dry up nor draw in. This new development will afford users, low first cost, reduced expense and higher production.

As manufacturers of a broad line of leather specialties for oil-industry application, C. L. & W. W. Auer is in a position to make recommendations on special problems the producer may encounter and supply the type of packing which in its experience, will prove satisfactory for the use intended.

Gulf Coast Steel-Barrel Plant To Be Placed in Operation

Gulf Coast Steel Barrel Co., newly chartered subsidiary of Jones & Laughlin Steel Corp., will place in operation early in December a $300,000 manufacturing plant at Port Arthur, Tex., that may be only a first unit in possible future developments, Roy E. Hurd, president, has announced. The plant will have an hourly capacity of 250 steel barrels--a carload—and will employ 150 men, Mr. Hurd said. It will serve primarily the petroleum industry in the Southwest. Sheet steel for the plant will be barged down the Ohio and Mississippi rivers and through the Intracoastal Canal to Port Arthur. The fabricated products—steel barrels of from 15 to 55 gal. capacity—will be distributed by rail and water to consuming points in the South.

The present building, 275 ft. in length and 75 ft. in width, is situated on a 10-acre tract fronting the ship channel. Thomas Bate & Sons of Houston, Tex., of which E. E. Echols is construction superintendent, erected the structure.

BUSINESS NOTES

At the twelfth annual meeting of the Meehanite Research Institute of America, Inc., held in Milwaukee, Wis., the following officers were unanimously reelected for 1941: President, Oliver Smalley, president of Meehanite Metal Corp., Pittsburgh, Pa.; vice president, H. B. Hanley, of American Laundry Machinery Co., Rochester, N. Y.; secretary-treasurer, Frank M. Robbins, president of Ross-Meehan Foundries, Chattanooga, Tenn.

Announcement has been made by Schlumberger Well Surveying Corp. to the effect that its precision gun perforating service is now available in Mid-Continent fields. Schlumberger offices in the Mid-Continent area are located at Tulsa and Oklahoma City, Okla., and Wichita, Kans.

The Babcock & Wilcox Tube Co., Beaver Falls, Pa., announces that the sale and distribution of its seamless steel tubular products in Argentina, Brazil, Paraguay, and Uruguay are handled by Babcock & Wilcox, Ltd., of London, England, through their offices in these countries.

Praeger Made President of Alcorn; Lyster Elected Vice President

Alcorn Combustion Co., Philadelphia, Pa., has announced the election of Frank H. Praeger as president and director of the company and Roy S. Lyster as vice president and director.

Mr. Praeger is a native of San Antonio, Tex. He was graduated from the University of Pennsylvania in 1923, and after graduation worked for the Public Service Co. of New Jersey. Since 1926 he has been associated with the Alcorn Combustion Co. as sales engineer and was in charge of the company's first branch offices in Tulsa and later in Los Angeles and San Francisco, Calif. In 1935 he was made sales manager and in fulfilling the duties of that position he has visited every refining district in the country.

Mr. Praeger is a member of the American Petroleum Institute; Tau Beta Pi, honorary engineering fraternity; Sigma Pi, social fraternity; and St. Davids Golf Club. He has published several papers on the design of petroleum heaters, the true vapor-phase process, and has had issued to him a number of patents.

Mr. Lyster is a native of Philadelphia. He was graduated from the University of Pennsylvania in 1919, and is a member of the Delta Sigma Phi fraternity. Mr. Lyster received his early engineering experience with Henry Disston & Sons, Inc., Barrett Co., and the Atlantic Refining Co. He joined the engineering force of the Alcorn Combustion Co. in 1927 and in 1935 was made chief engineer.

W. W. Brown Made Vice President Of Smith Meter Co.

Walter W. Brown, who, for the past 14 years, has been connected with the Ralph M. Brodie Co., of Oakland, Calif., has been appointed to the vice presidency of the Smith Meter Co. at Los Angeles.

"Mr. Brown's appointment to this post," said H. F. Detrick, president of the Smith Meter Co., "comes as a result of his years of experience in the marketing and distributing branches of the petroleum industry. For many years Mr. Brown has specialized in the development and use of meters for measuring petroleum products at both wholesale and retail points of sale."

The company recently announced a new line of meters which incorporate many improvements developed in their laboratories through close contact with field conditions. All Smith meters are of the rotary type and have established a reputation for extreme accuracy and measuring speed. The new line includes three sizes in truck meters, five models of line meters from 0 to 650 g.p.m., and five high-pressure meters capable of handling up to 650 g.p.m. and operating under pressure up to 1,000 lb.

Byron Jackson Announces New Side-Door Elevator

Byron Jackson Co. announces the development of a new elevator for handling strings of external-upset drill pipe weighing up to 300 tons. This Type BB elevator is of the side-door type and is of extra-heavy construction, made of alloy-steel property, heat-treated to give maximum strength and to withstand shock loads.

The side door acts as a strong connecting latch which prevents the body from spreading under the wedging action imposed by the external upset of the drill pipe when extremely heavy loads are carried. When the elevator is swung into position around the drill pipe below the upset a "closing finger" (which is integral with the door) causes the door to swing shut and latch automatically. As the load is taken, the upset fits into the recessed and tapered upper portion of the body where it remains until the load is relieved and the elevator is droppd below the upset. The T-head latch which locks the side door has a positive, horizontal action which is not affected by vertical jars and shocks. A curved end on the latch facilitates easy opening when the load has been relieved.

A rear handle, integral with the body, contributes to the safety and speed of handling the elevator by offering a convenient way to swing the elevator on and off of the pipe. The BJ Type BB side-door elevator is regularly furnished for external upset drill pipe, having the standard 18° angle, but can be bored to meet other specifications. For further information regarding this elevator write to Byron Jackson Co., P.O. Box 2017, Terminal Annex, Los Angeles, Calif.

Web Wilson Adds 500 and 100-Ton Rotary Connectors

Five-hundred and one-hundred ton rotary connectors recently added to the line of oil tools manufactured by Web Wilson Oil Tools, Huntington Park, Calif., are said to embody latest improvements in design and materials. Features include an oil bath in which the plunger and bearing operate which insures perfect lubrication of the bearing and a cushion for the spring action. A simple locking device which, when locked in the drilling position, allows picking up a single from the pipe rack; ease of rotation because of a large, double roller bearing; an improved swivel adaptor which provides greatest convenience and economy, and many other advantages are included. Illustrated literature describing these connectors is available from the manufacturer.

Kieswetter in Argentina For U. S. Rubber Export

Herbert G. Kieswetter of United States Rubber Export Co. as he was about to leave for Brazil and Argentina, chats with John D. Clarke (right) of the

same organization. Both men are regional sales directors for U. S. Rubber Export. After a trip by rail from New York, Mr. Kieswetter flew from Miami, Fla., via Pan-American, with stops at Rio de Janeiro, Sao Paulo and Buenos Aires. During his stay of several weeks in the Argentine he will meet with local oil company officials and visit the oil fields.

TRADE LITERATURE

℅ PROPORTIONEERS, INC. ℅, 9 Codding Street, Providence, R. I.—Bulletin TOU-6, describes a complete line of automatic treating, feeding, diluting, blending, proportioning and sampling equipment, for gasoline, lubricating oil and asphalt products. Also treatment and chlorination and chloramination of general water supplies for power, process and sanitary use. Applications include: Flow proportional gum inhibiting and dyeing of gasoline, continuous blending of gasoline, lubricating oils and asphalts, acid treating and neutralizing oils and gasolines, doctor treating and caustic wash, chloramination of condenser water for improving coefficient of heat transfer, chemical treatment of boiler feed, steam, air, hydraulic or electric drive. rugged simple construction and accurate performance under commercial or pilot-plant conditions.

WISCONSIN MOTOR CORP., Milwaukee, Wis.—Bulletin and folder describing its new Model VE4 four-cylinder, air-cooled engine which is featured by the air-cooling design, Timken roller main bearings, light weight and compactness. The V-type, 20-hp. engine, of 2-in. bore and 3¼-in. stroke with a displacement of 92 cu. in., weighs only 285 lb. and has an overall length of 24 in., height of 23 in., and width of 21½ in. overall.

THERMEK CORP, 105 West Adams St., Chicago.—Bulletin 440—"More Heat Transfer Per Foot," a 24-page engineering manual describes in detail how Thermek—the integrally spined extended surface tubing—can be used to reduce the size, weight, and cost of all types of heat-transfer equipment. Extensive tabulations of overall heat-transfer coefficients and product design information are submitted for the following: Steam-blast coils, water coils, evaporative condensers, water-cooled Freon condensers, water-cooled methyl chloride condensers, instantaneous water heaters, oil and gas-fired water heaters and boilers, oil coolers and heaters, Freon heat exchangers, water-to-water exchangers, convectors, kerosene heaters and coolers, and carbon tetrachloride condensers. The test results from numerous actual installations are submitted to show the large savings that were effected with Thermek. Physical data covering all sizes of tubing in the six different metals available are listed for convenience in adapting this integrally spined extended surface to other applications.

INTERNATIONAL NICKEL CO., 67 Wall Street, New York.—A 16-page folder, "Practical Pumping Problems and How They Are Solved," discussing in detail the uses of monel, K-monel and S-monel for pump parts in applications where there is need for high resistance to corrosion, wear, pitting, or scoring. This includes different types of pumps, such as reciprocating, centrifugal, and rotary pumps. Part of the book is devoted to a review of case histories. Complete performance data is given on pumps in various applications which suggest how sizable savings can often be made in maintenance and replacement costs. Much attention is given to the choice of suitable materials for pumps handling a variety of corrosives in a wide range of industries, including power, chemical, municipal water supply, processing, railroad, steamship operation, and other diversified fields. The booklet is of a semitechnical nature and is being distributed without charge.

Haering Inhibitors Control Corrosion In Steam and Return Lines

A revolutionary method for the prevention and control of corrosion in steam and return systems is announced by D. W. Haering & Co., Inc., 2308 S. Winchester Avenue, Chicago. The water-soluble film inhibitor, quachrom glucosate, is introduced directly into the steam line. The direct method of inhibitor introduction is a development of a problem solved by the Haering organization several years ago. Costly corrosion of gas pipe lines presented a difficult problem to solve. The direct introduction and rapid dispersion of glucosate solutions in the natural-gas streams is the answer to that problem. Today, this method is serving the natural-gas industry and is being adapted successfully to steam and return lines.

Quachrom glucosate is bled into the steam line in proportion to steam flow by means of a Haering fluid piston proportioning machine or a Nelson chemical proportioning pump. As little as 5 lb. of this substance will treat 1,000,000 lb. of steam. Processes and equipment presenting specific corrosion problems may be treated individually by introducing the inhibitor immediately before the steam enters the equipment concerned. Plants purchasing steam from outside sources may treat the steam with quachrom glucosate before it passes into the steam system without regard to the source of steam.

In many cases, introduction of the inhibitor may be made directly into the main steam header. Sometimes the bulk of the condensate is returned to the boiler and the steam treatment may replace boiler-water treatment entirely by adjusting the steam-treating formula to meet the boiler-water requirements.

Bastian-Blessing Distributing Forster Torch Line

The Bastian-Blessing Co., 242 East Ontario Street, Chicago, has taken over the distribution of the Forster torch line manufactured by Ransome Co. for the entire United States east of the Rocky Mountains. Forster torches are designed especially for use with butane and propane gases and they are well known to the liquefied petroleum-gas industry. Their use for heating, metal working, soldering, paint burning, lead melting, etc., offers another profitable outlet for butane and propane gases for industrial purposes.

The Bastian-Blessing Co.'s sales organization and their distributors will handle the sale of this equipment. A complete stock of Forster torches will be maintained at the company's plant in Chicago.

Blackmer Pump Reorganizes Sales Divisional Setup

The Blackmer Pump Co., Grand Rapids, Mich., as a step in its plan to enlarge its field of activities, have effected a reorganization of the sales divisional setup, it was announced by N. J. Harkness, executive vice president and general manager In this expansion setup, Bruce P. Hetler, who has formerly held the title of general sales manager, has been made manager in charge of engineering sales and J. B. Trotman now becomes general sales manager in charge of sales distribution and advertising.

Mr. Trotman is a newcomer to the Blackmer organization but has had years of pump-sales experience with Goulds Pumps, Inc., and lately as manager for the Roots-Connerville-Blower Corp., turbine pump division.

The Blackmer Pump Co. has for over 35 years engaged in the manufacture and sales of rotary pumps. During the past year the company has greatly expanded its line of activity, adding a new type of hand pump, a line of small direct-connected rotary pumps, pumps for handling high pressures, and a redesign of many of their standard types for the added uses to which rotary pumps have been adapted during the last few years.

"Oilwell" 21-In. Rotary Designed For High Operating Speeds

The recent trend to ever-increasing rotating speeds has created a need for equipment specifically designed for this service. To meet this demand Oil Well Supply Co. has developed its new 21-in. Super-Speed rotary, designed for and tested at speeds as high as 1,000 r.p.m. Recommended maximum drilling depth is 17,000 ft.; rated super table deadload capacity is 300 tons, and gear ratio is 2.61 to 1. Its construction embodies many advanced features.

21-in. Super-Speed Rotary

The gear train is of the quiet-operating spiral-bevel type. Both gear and pinion are fully heat treated, forged, alloy steel, and in addition the pinion is surface hardened. The main bearing, specially developed for high-speed applications, is of the self-centering, angle-contact ball type with surface-hardened, heat-treated and ground, alloy-steel races and precision-ground balls of large diameter.

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The fully heat-treated pinion shaft, pinion locking wheel, lubricator-drive pinion-shaft roller bearings, and their housings comprise a compact and extremely sturdy unit assembly which fits into a cylindrical opening cast integral with the base, providing a very rigid construction. Locking arrangements are safe, convenient, and semiautomatic in operation.

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ATTENTION. Why not locate Oil? A dry structure is not profitable. Unless we locate the Oil and Gas for you you pay us nothing for the survey. Maps and written reports furnished free. A Direct Geophysical Method that you can understand. Write Gravitational Selector, 14957 Lakewood Heights Boulevard, Lakewood, Ohio.

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FOR the week ended November 16, 1940 statistics show that in Illinois there were the following completions: Oil—56, Gas—0, Dry—21, Total—77. My method quickly eliminates territory of non-mineral formation and thereby avoids drilling of dry wells. For information address Box A-268, The Oil and Gas Journal, 1404 W. Madison, Chicago, Illinois.

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Will finance and manufacture proven equipment, small or large that will be salable to the oil industry.
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The Oil and Gas Journal,
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1940 OIL AND GAS FIELD MAP
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DRY DOCK; wood, 10,000-ton D.W.T.
DREDGE: hydraulic, for approx. 18" to 24" section line.
TUGS & BARGES; ocean.
IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Ave., Chicago, Illinois
'Anything containing IRON or STEEL'

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PETROLEUM Engineer, Geophysicist, and Geologist, with twelve years' experience; desires connection with a reliable oil company. Box A-241, The Oil and Gas Journal, Tulsa, Okla.

MATERIAL and Supply Man seeks position in charge of Oil & Gas Field Supplies. Familiar in drilling, production and pipe line work. Also can assume charge of Commissary purchases. Best of references, can give bond. Nothing promotional. Address Box A-251, The Oil and Gas Journal, Tulsa, Okla.

CERTIFIED PUBLIC ACCOUNTANT Employed as senior by national public accounting firm desires connection with corporation or private concern. University graduate, four years of oil and drilling company accounting experience; six years of public accounting, auditing and income tax work. Industrious, studious and personable. Age 32; married; two dependents. Box A-250, The Oil and Gas Journal, Tulsa, Okla.

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Box A-267
The Oil and Gas Journal, Tulsa, Okla.

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WANTED: Man acquainted with producers to buy Thread Protectors. Must have pick-up truck. Excellent opportunity. Give full details about yourself in first letter. Box A-234, The Oil and Gas Journal, Tulsa, Okla.

WANTED—Chemical or Petroleum Engineering Graduate with training in colloidal chemistry to engage in research work on bentonitic clays. Opportunity to pursue graduate work leading toward the doctorate. Reply Box A-261, The Oil and Gas Journal, Tulsa, Okla.

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Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

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Oil Industry Printing

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Addresses Wanted

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Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

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5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
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This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

FOR SALE

One gasoline drilling rig with two 85 H.P. Waukesha motors and unitized draw works complete.
300 sets 3" A.P.I. tool joints.
10,000 Ft. 7" O.D. 26# seamless casing, once run.
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In addition to the above we have 20,000 Ft. of 6" screw line pipe in Oklahoma; also drilling rig capable of drilling to 6500 feet, complete stock of line pipe, casing, drilling and pumping equipment.

Wire, Write or Phone for Prices

Louisiana Iron & Supply Co.
Shreveport, La.

FOR SALE—USED BOILERS
3 90HP-225SWP Acme Oklahoma City
LUCEY PRODUCTS CORPORATION
TULSA

FOR SALE: At our Oklahoma City warehouse slightly used Cardwell KS DHS skid type oil well servicing unit equipped with DHK Waukesha motor. I. T. I. O. Co., Bartlesville, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

NOTICE — CABLE-TOOL CONTRACTORS. Save money; good used wire lines. All sizes up to 5,000 ft. long. See us before you buy. General Tool & Supply Co., P.O. Box 4387, Oklahoma City, Oklahoma.

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FOR SALE

30-TON S/G LIMA GASOLINE, 0-4-0 SWG, LOCO. NEW 1931, GOOD COND. ROLLER BEARING. Immed. Delivery.
SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES
IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Ave.
Chicago, Ill.
***"Anything* containing IRON or STEEL"**

FOR SALE: At Bartlesville, Oklahoma, 1—set (2) 10" x 6' drilling bits 4 x 5 pin, good condition, $75.00. I. T. I. O., Bartlesville, Okla.

YOUNG six-cylinder Drilling Engines, Cyclone and Waukesha four-cylinder Drilling Engines, Marion single-cylinder 25 H.P. Gas Engine with Standard Clutch, Reid Reverse Clutch on skids, Ingersoll-Rand ER1 10 x 8 Compressor, one 12 x 10 ER1 Cylinder with Piston and Rod, Electric Generating Units, 180 H.P. Buda JL-6 power unit with Clutch, Under-Road Boring Machine for pipe lines.
A. E. AVERS, Representative,
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Fully equipped modern shop—all makes repaired
Low cost—service unsurpassed—all work guaranteed
Send for list of reconditioned instruments
We pay cash for used instruments
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Chicago Sales Representative—W. & L. E. Gurley

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FOR SALE: At Bartlesville, Oklahoma, 1—50 HP Kewanee locomotive type boiler with stack 150# WP. Will pass state inspection. $200.00. I. T. I. O., Bartlesville, Okla.

COMPLETE 6500 BBL. TOPPING AND CRACKING PLANT
BARNSDALL REFINERY—OKMULGEE, OKLAHOMA
2500 BBL. KELLOGG CRACKING UNIT—4000 BBL. TOPPING
Will sell all or any part—Will quote "As is",
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FOR SALE
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NEW SEAMLESS STEEL COUPLINGS

400—5½" O.D., 8 round thread x 6¾" long, Casing at .....55c each
300—4", 8 thread x 4⅝" long, Line at .....55c each
1000—13" O.D. (12½" Pipe) 8-V thread, x 8¼" long, Line at $1.65 ea.

RECONDITIONED PIPE
30,000 feet 12", 50 lb. at $1.25 per foot
100,000 feet 6" Std. at..... .38 per foot
All of the above F.O.B. Philadelphia District, subject to prior sale. Pipe in lengths 18' 0" and longer, plain ends.

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1424 N. NINTH STREET
PHILADELPHIA PENNA.

FOR SALE: In Oklahoma City field 50—1000 barrel BS&B VP used oil storage tanks, Cheap. I. T. I. O., Bartlesville, Oklahoma.

FOR SALE—One gasoline rig with 2 Mack 165 H.P. dual-ignition motors, and 4000 ft. 4 inch drill pipe. All in excellent condition. KILGORE MACHINE SHOP, Kilgore, Texas.

FOR SALE: 4—OCS Roller Bearing Chain Driven Sand Reels. I. T. I. O., Bartlesville, Okla.

TRACTORS
Caterpillars, crawler type, size "35," $375; size "65" with nigger-head winch, $750; Caterpillar RDS with bulldozer, $2000; Allis-Chalmers Model L with bulldozer $1750. Guaranteed, slightly used. O. C. Evans, Mt. Sterling, Ky.

FOR SALE OR MAY LEASE
COMPLETE
STANDARD DRILLING OUTFIT
ALL equipment is the latest type and is in first class condition. New 125 Diesel Caterpillar. This outfit is complete with fishing tools. Inquire Box 112, Jerome Hotel, St. Joseph, Mo.

FOR SALE: At Oklahoma City 2—set slightly used 6½" Spang Weldless drilling jars 4½" stroke 3¼"—4¼" box and pin, $100.00 per set. I. T. I. O., Bartlesville, Okla.

ONE 40 H.P. Type P.S. heavy duty Superior gas engine in A-1 shape. Has diesel attachments with straightway clutch, pump and lubricator. Wolfson Pipe & Supply Company, Wichita Falls, Texas.

FOR SALE
BRAND NEW PIPE
12¾" O.D. } L.L.C. or
20" O.D. } Carload
24" O.D. } Lots.
Money-saving prices on request.
Write or wire Box A-262, The Oil and Gas Journal, Tulsa, Okla.

Equipment Wanted

WANTED a used portable drilling outfit. Send me complete information and cash price. D. L. Williams, 723 S. Broadview, Wichita, Kansas.

WANTED—USED TANK CARS
Interested in purchase of one or more not older than 1927-built class #4 tank cars with 50-ton trucks. Communicate Box A-265, The Oil and Gas Journal, Tulsa, Okla.

Financing

WANTED—Oil loans $250,000 to $5,000,000. Low rates, long terms. L. A. (Pat) Casey, 511 Lexington Ave., New York; Esperson Bldg., Houston.

DEVELOPMENT loan or advance negotiated on commission basis for a matter of exceptional merit. Box 5411, Philadelphia.

TRUSTEE'S SALE IN BANKRUPTCY

In U. S. District Court, Western District of Oklahoma
IN RE: STERLING REFINING COMPANY, NO. 5959 IN BANKRUPTCY

I, D. E. Hodges, Trustee of the Sterling Refining Company, bankrupt, will sell the assets of Sterling Refining Company, bankrupt, at the U. S. District Court Room, Post Office Building, Oklahoma City, at 1:00 o'clock P. M. on December 10, 1940, in parcels or as an entirety, for cash, subject to approval and confirmation of U. S. District Judge. Assets include pipe line system in Oklahoma City oil field, and refinery buildings, improvements, machinery and equipment at refinery site on leased ground located on N side of Rock Island RR Tracks east of Eastern Avenue in Oklahoma City, office building, laboratory building, pump house, boiler house, continuous treater, tankage, stills, towers, boilers, pumps, loading rack, water well and electrical pumping equipment, warehouse, contents of all buildings, fencing, etc. Sealed bids may also be submitted for any parcels of the property or as an entirety to be opened at date, time and place of open sale. Property may be seen at the refinery (watchman in charge) and bids submitted to D. E. Hodges, Trustee, Legal, Dept., Phillips Petroleum Co., Bartlesville, Okla., or in care of Clerk of U. S. District Court, Oklahoma City, or in care of L. W. Pratt, Attorney for Petitioner, 720 World Building, Tulsa, Oklahoma.

November 25, 1940

D. E. Hodges, Trustee,
Sterling Refining Company, bankrupt.

New York Markets

(Continued from Page 95)

in the October report of the Bureau of Foreign and Domestic Commerce. Exports of fuel oil totaled 3,784,000 bbl. in October against 1,871,000 bbl. in September; gasoline, 2,729,000 bbl. against 1,528,000 bbl. and lubricating oils, 972,000 bbl. against 387,000 bbl. The increase in value of lubricating-oil exports from $3,472,000 in September to $8,588,000 in October is undoubtedly a contributing factor to the better feeling among lubricating-oil processors.

Colonial Beacon Oil Co., Boston, obtained the largest bunker fuel-oil contract let by the Navy Department last week. The awards follow: Colonial Beacon Oil Co., Boston, $325,805; Standard Oil Co. of Kentucky, Louisville, $49,254; Texas Co., $42,750; Maritime Oil Co., Houston, $99,500; Standard Oil Co. of Louisiana, New Orleans, $137,300; Eastern Petroleum Corp., Jacksonville, $67,272; Sinclair Refining Co., New York, $172,350; Pure Oil Co., Chicago, $45,000; Humble Oil & Refining Co., Houston, $36,722; City Fuel Oil & Coal Co., Inc., St. Petersburg, $30,720; Belcher Oil Co., Miami, $47,920; Colonial Bunker Oil Co., Savannah, $60,000. Shell Oil Co., Inc., New York, was awarded a $30,528 diesel-fuel-oil contract.

Gulf Coast Markets

(Continued from Page 95)

added to the uncertainty and confusion, although some refiners were of the opinion that they might be able to hold the fuel market, in view of the expected heavy demand, and thus benefit.

General advances in tank-wagon prices of gasoline throughout Texas of from ½ to 2 cents, effective December 3, were announced by the Texas Co. The minimum advance in the immediate Houston area was 1 cent. In the state, however, there were points where only a half-cent advance was in line, due to local conditions. So far the advances have not been followed by other larger marketers.

According to the announcement, the increase was made as a move to bring gasoline prices more nearly into proper ratio with prevailing crude prices, and thus was not a reflection of any strengthening in the refinery gasoline market, which continued sloppy. Within the past several weeks movements of gasoline out of Gulf Coast ports have dropped off substantially, and at this time of year there is not much chance, normally, of any important new buying.

LEGAL

Department of the Interior, United States Land Office, Cheyenne, Wyoming. Notice is hereby given that a lease of the oil and gas deposits in lot 6 (NW¼ SW¼) and SW¼ SE¼ Sec. 6, T. 26 N., R. 89 W., 6th P.M., 81.64 acres, in the Wertz Dome (additional) oil and gas field, Wyoming, is offered to the responsible qualified bidder of the highest bonus per acre, the minimum bid to be $15.00 per acre, pursuant to the provisions of section 17 of the act of February 25, 1920 (41 Stat. 437), as amended, at the royalty rate scale in the lease form shown in circular 1386, at a sale to be held in the office of the Register of the district land office at Cheyenne, Wyoming, at 10:00 a.m. on December 18, 1940. The successful bidder will be required to deposit on the day of the sale a certified check on a solvent bank, or cash, for one-fifth of the bid, and file a showing of qualifications to receive the lease required by section 7 of General Land Office circular 1386. The remaining four-fifths of the bid, together with the annual rental in advance at the rate of $1.00 per acre, must be paid and a $5000 corporate surety bond must be furnished prior to the issuance of the lease. The successful bidder is required to subscribe to the unit plan of operation for the Wertz Dome field, as approved by the Secretary November 4, 1937. Bidders are warned against violation of the provisions of section 59 of the United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register.

INDEX TO ADVERTISERS

A

Abercrombie Pump Co. 90
AC Spark Plug Division of General Motors Corporation
Acme Fishing Tool Co.
Aero Exploration Co.
Air Reduction Sales Co.
Ajax Iron Works
Alco Products Division of American Locomotive Company
Allis-Chalmers Mfg. Co.
Allison, R. J. 80
American Blower Corporation
American Bosch Corporation 5
American Cable Division of American Chain & Cable Co., Inc. Inside Back Cover
American Cast Iron Pipe Company
American Hoist & Derrick Co.
American Iron & Machine Works
American Locomotive Company, Diesel Engine Division
American Meter Company 6
American Roller Bearing Co.
American Rolling Mill Co., The
American Steel & Wire Company
Armstrong Bros. Tool Co.
Armstrong Machine Works 88
Ashcroft Gauge Division 75
Athey Truss Wheel Co.
Auer, C. L., and W. W.
Austin-Western Road Machinery
Axelson Manufacturing Company

B

B and M Construction Corp. 58
Baash-Ross Tool Company
Babcock & Wilcox Tube Company, The
Badger & Sons Co., E. B.
Baker Oil Tools, Inc. 8
Baldwin-Duckworth Division of Chain Belt Company
Bantam Bearings Corp. 4
Baroid Sales Division, National Lead Company
Barret, William M., Inc.
Beaird Corporation, J. B. 75
Bethlehem Supply Company
Bethlehem Steel Co. 1
Braden Steel Corporation
Brance-Krachy Co., Inc.
Brauer Machine & Supply Company
Brewster Company, The
Bridgeport Machine Company, The
Bristol Company, The
Broderick & Bascom Rope Co.
Brodie Co., Ralph N. 58
Brown Instrument Company, The
Bruning, Charles Co., Inc.
Buck Clamp Company
Buckeye Traction Ditcher Co.
Bucyrus-Erie Co.
Buda Co., The
Burgess Battery Co.
Butler Manufacturing Co.
Byron Jackson Co.

C

Cable, Jo H.
Cameron Iron Works, Inc.
Cardwell Mfg. Co., Inc.
Carey Company, The Philip
Carnegie-Illinois Steel Corporation
Cast Iron Pipe Research Association, The
Caterpillar Tractor Co. 46-47
Cavins Company
Century Electric Company
Cessna Aircraft Company
Chain Belt Company
Chaplin-Fulton Mfg. Co., Inc.
Chapman Valve Mfg. Co., The
Chemical Process Co., Inc., The
Chevrolet Motor Division, General Motors Sales Corporation
Chicago Bridge & Iron Company
Chiksan Tool Co.
Clark Brothers Company
Classified Advertising 102-103
Cleveland Trencher Company
Climax Molybdenum Company 57
Columbia Steel Company
Columbian Steel Tank Co.
Continental Motors Corp.
Continental National Bank of Fort Worth
Continental Oil Co.
Continental Supply Company, The
Cooper, Fred E.
Cooper-Bessemer Corp., The
Core Laboratories, Inc.
Crane Co.
Cummins Engine Co.
Crutcher-Rolfs-Cummings 58
Curtin, W. H. & Co., The

D

D & M Machine Works
Darling Valve & Mfg. Co.
Davis Regulator Mfg. Co., The
Dayton Rubber Mfg. Co., The
Dearborn Chemical Co.
Dempsey-Wilson Construction Co. 58
Diamond Chain & Mfg. Co.
Dodge Division, Chrysler Corporation
Dowell Incorporated
Dragon Mfg. Co., The 75
Dresser Mfg. Co., The
Drilling Equipment Directory 81
Duff-Norton Manufacturing Co., The 85
Du Pont de Nemours & Co., Inc.
Durametallic Corp.

E

Eagle-Picher Lead Co.
Eastman Oil Well Survey Co.
Economy Electric Lantern Co. 84
Elastic Stop Nut Corp. 80
Electrical Facilities, Inc. 59
Emsco Asbestos Company
Emsco Derrick & Equipment Company
Engineering Laboratories, Inc.
Ensign Carburetor Company, Ltd.
Ethyl Gasoline Corporation 30-31

F

First National Bank of Fort Worth
First National Bank in Houston
First National Bank & Trust Co. of Tulsa, The
Fisher Governor Company
Fluid Packed Pump Co.
Fluor Corporation, Ltd., The
Ford Motor Co.
Fort Worth Chamber of Commerce
Fort Worth Clearing House Association
Fort Worth National Bank, The
Foster Wheeler Corp.
Foxboro Mfg. Co., The
Franks Mfg. Co.
Frick-Reid Supply Corporation

G

Gardner-Denver Company
Garlock Packing Company, The 43
Gaso Pump & Burner Mfg. Co.
Gasoline Products Co., The
Gates Rubber Co., The
Gatke Corporation
General American Transportation Corporation—Terminal Division 77
General Electric Company
General Paint Corporation
General Power, Inc.
Geological Scientific Service Company
Geophysical Service, Inc.
Gilmer Company, L. H.
Girdler Corporation, The 71
Goodall Rubber Co.
Goodrich Company, B. F., The
Goodyear Tire & Rubber Co.
Gott, H. P., Mfg. Co.
Grant Oil Tool Co. 81
Graver Tank & Mfg. Co., Inc.
Gray Processes Corporation, The
Great Lakes Steel Corporation
Green Head Bit & Supply Co.
Guiberson Corporation
Gulf Oil Corp.
Gulf States Utilities Co.
Gustin-Bacon Mfg. Co.

H

H & M Pipe Beveling Machine Co.
Halliburton Oil Well Cementing Co. Inside Front Cover
Hanlon-Buchanan, Inc.
Harley Sales Co.
Harnischfeger Corporation
Harrisburg Steel Corporation
Hazard Wire Rope Division of American Chain & Cable Co., Inc.
Hewitt Rubber Corp. 60
Hill-Hubbell & Co.
Houston Engineers, Inc.
Houston Oil Field Material Co.
Houston Pipe Appliance Co.
Hughes Tool Co. Back Cover
Humble Oil & Refining Co.
Hydril Co.

I

Independent Exploration Company
Industrial Engineering Co. 59
Inferno Co., The
Ingersoll-Rand Co.
International Harvester Co. 36
International Nickel Company, Inc., The

J

Jadson Motor Products Company
Jarecki Manufacturing Company
Jensen Brothers Manufacturing Co.
Jerguson Gage & Valve Co.
Johns-Manville Corporation 86
Jones Company, The S. M.
Jones & Brooks, Inc. 59
Jones & Laughlin Steel Corporation

K

Keeley Institute, The 74
Kellogg, M. W., Company, The
Kennedy Valve Mfg. Co., The
Kerotest Manufacturing Company
Keuffel & Esser Co.
Key Company
Kobe, Incorporated

L

Laminated Shim Company, Inc.
Landis Machine Company, Inc.
Lane-Wells Company 51
Larkin Packer Company, Inc.
Layne & Bowler, Inc.
Leeds & Northrup Co.
Le Roi Company
Leschen, A., & Sons, Rope Co.
Lincoln Electric Company, The 28
Line Scale Co., Inc.
Link-Belt Company
Lockheed Aircraft Corporation
Lone Star Cement Corporation
Long, S. A., Co., Inc.
Lucey Export Corporation
Ludlow Valve Mfg. Co., The
Lufkin Rule Co.
Lummus Co., The
Lunkenheimer Co., The 2

Mc

McEvoy Company 43
McGregor Working Barrel Company
McKissick Products Corp.

M

MacClatchie Manufacturing Company
Macwhyte Co.
Magnolia Airco Gas Products Co.
Maloney Tank Mfg. Co.
Manhattan Rubber Mfg. Division
Manning, Maxwell and Moore, Inc. 75
Marley Company, The
Marmon-Herrington Co., Inc.
Marsh, James P., Corp.
Martin-Decker Corp.
Mayfair Hotel
Medart Company
Meehanite Research Institute
Merco Centrifugal Co.
Merco Nordstrom Valve Co.
Mercoid Corporation
Metric Metal Works
Mid-Continent Engineering Co., Inc.
Mid-Continent Supply Company
Midwest Piping & Supply Company, Inc., The
Miller Sand Pump Co.
Mission Mfg. Co., The 67
Monsanto Chemical Company
Morse Chain Company
Murray Rubber Company

N

National Bank of Tulsa 52
National Carbon Co., Inc.
National Steel Corporation
National Supply Co., The
National Transit Pump & Machine Co. 55
National Tube Co.
Nelson, J. B.
New Bedford Cordage Co. 80
Newman, Hender & Co., Ltd
Norton Company
Novo Engine Co.
Nugent, Wm. W., & Co., Inc.

O

O.C.S. Mfg. Co., The
Ohio Injector Co., The
Oil Center Tool Co.
Oil Well Supply Co. 20
Oliver United Filters, Inc.
Osage Metal Company 81
Otis Pressure Control, Inc.

P

Page Fence Association
Page Steel & Wire Division of American Chain & Cable Co.
Parkersburg Rig & Reel Co.
Parkhill Truck Co.
Parkhill-Wade
Patterson-Ballagh Corporation 90
Pease, C. F., Company, The
Peerless Pump Division of Food Machinery Corp. 80
Penberthy Injector Co.
Pennington Signaling Core Barrel
Pennsylvania Grade Crude Oil Association
Perco, Inc.
Petroleum Advisers, Inc.
Petroleum Electric Power Association
Petroleum Rectifying Company
Petty Geophysical Engineering Co.
Phelps Dodge Refining Corporation
Pittsburgh-Des Moines Steel Company
Pittsburgh Equitable Meter Co.
Pittsburgh Steel Company
Plymouth Cordage Co.
Poist Tool Co.
Pomona Pump Co.
Portable Rig Co.
Powell, Wm., Co., The
Price, H. C., Co.
Pritchard, J. F., & Co.
Producing Equipment Directory
% Proportioneers, Inc. % 84
Pure Oil Co.

R

Reading-Pratt & Cady Division of American Chain & Cable Co.
Rector Well Equipment Co., Inc. 81
Reda Pump Co.
Reed Roller Bit Company
Regan Forge & Engineering Co.
Reilly Tar & Chemical Corporation
Republic Rubber Division of Lee Rubber & Tire Corp.
Republic Steel Corporation 48
Rockford Drilling Machine Division of Borg-Warner Company
Roebling's Sons Company, John A.
Ryerson & Son, Inc., Joseph T. 84

S

Safety Gas Main Stopper Co. 59
Schlumberger Well Surveying Corporation
Sealed Power Corp.
Security Engineering Co.
Seismic Explorations, Inc.
Seismograph Service Corp.
Shafer Bearing Corporation
Shand & Jurs Co. 72
Shell Development Company
Shell Oil Company, Incorporated
Sinclair Refining Company, Inc. 3
Skinner Co., M. B.
Smith, A. O., Corporation
Smith Company, E. M.
Smith Company, Howard
Smith, H. C., Oil Tool Co. 80
Smooth-On Mfg. Co., Inc.
Socony-Vacuum Oil Co., Inc.
South Chester Tube Co.
Southwestern Gas & Electric Company
Spang Chalfant, Inc.
Spang & Company 44
Sperry-Sun Well Surveying Co.
Spicer Mfg. Corp.
Standco Brake Lining Co. 80
Stanley Belting Corporation
Star Drilling Machine Co., The
Stearns-Roger Manufacturing Co.
Steel Founders' Society 68

T

Tansel Petroleum Co.
Taylor Forge & Pipe Works 41
Taylor Instrument Companies
Technical Oil Tool Corporation, Ltd.
Texaco Development Corporation 64
Thermoid Company
Thompson Tool Co., Inc.
Thornhill-Craver Co.
Thornton Tandem Co.
Timken-Detroit Axle Co.
Timken Roller Bearing Company 63
Timken Roller Bearing Company, Steel and Tube Division
Tobin, Edgar, Aerial Surveys
Toledo Pipe Threading Machine Co., The
Tretolite Company Front Cover
Trinity Portland Cement Company
Tru-Line Corporation
Tubbs Cordage Co. 81
Tube-Turns, Inc
Tulsa Boiler & Machinery Co.
Twin Disc Clutch Co.

U

Union Wire Rope Corporation
Unit Rig & Equipment Company
United Gas Pipe Line Co.
United Geophysical Co.
United States Rubber Company
United States Steel Corp., Subsidiaries 19-20
United States Steel Export Company
Universal Atlas Cement Co. 19
Universal Engineering Company, Ltd.
Universal Oil Products Co. 23

V

Vickers, Inc.
Viking Pump Co.
Visco Products Company 24
Vogt, Henry, Machine Co.

W

Walker, W. L., Co.
Wall-Colmonoy Corp.
Wall Rope Works, Inc.
Walworth Co.
Warren Petroleum Corporation
Waukesha Motor Co.
Wedge Protectors, Inc.
Well Equipment Manufacturing Corp.
Well Surveys, Inc.
Western Geophysical Company
Westinghouse Electric & Mfg. Co.
Wheeling Machine Products Company
Whitney Chain & Mfg. Co.
Wickwire Spencer Steel Company
Wilson Manufacturing Co., Inc.
Wisconsin Motor Corporation
Witte Engine Works 74
W-K-M Company, Inc.
Worthington Pump & Machinery Corporation
Wyatt Metal & Boiler Works

Y

Youngstown Sheet & Tube Co.

The Oil Man's Calendar Appears on Page 32